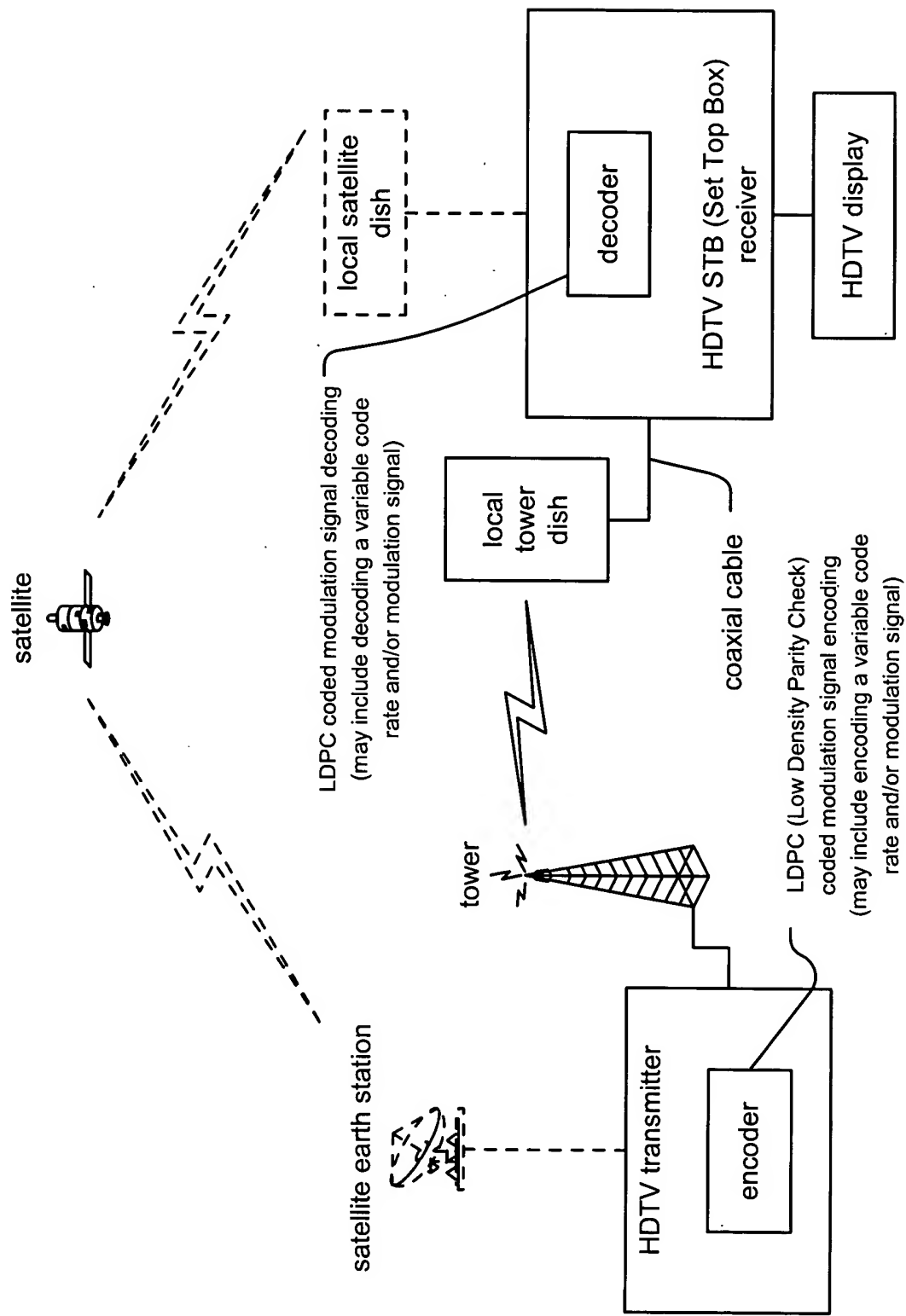


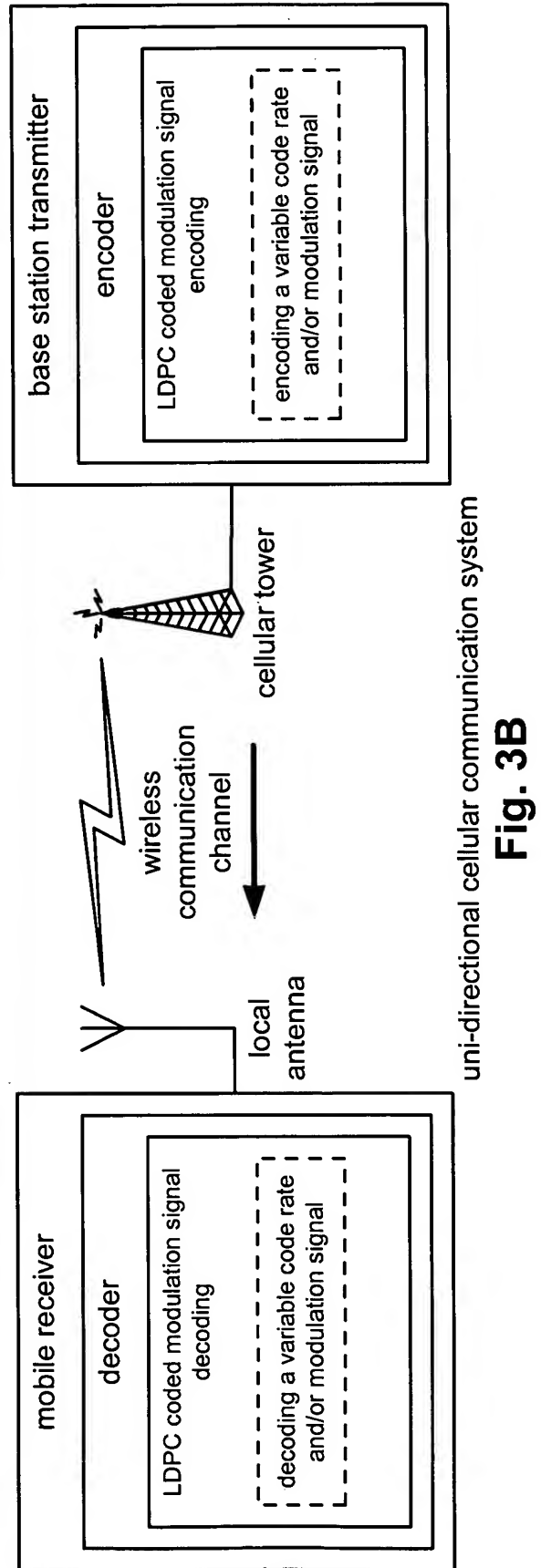
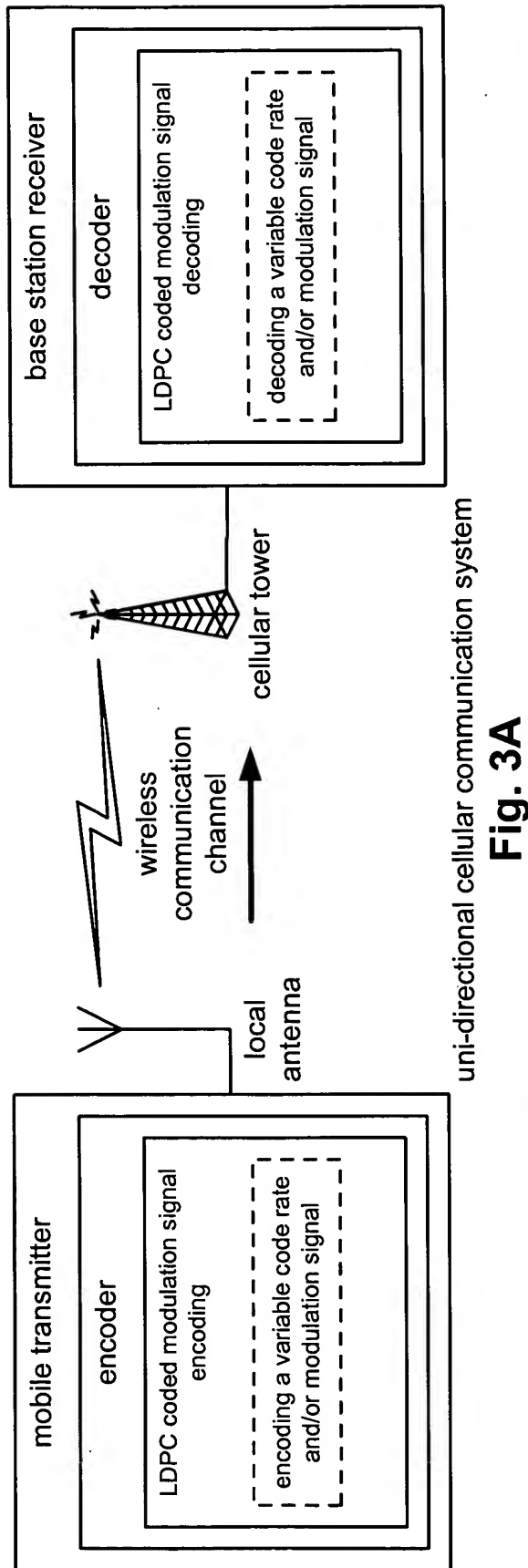
satellite communication system

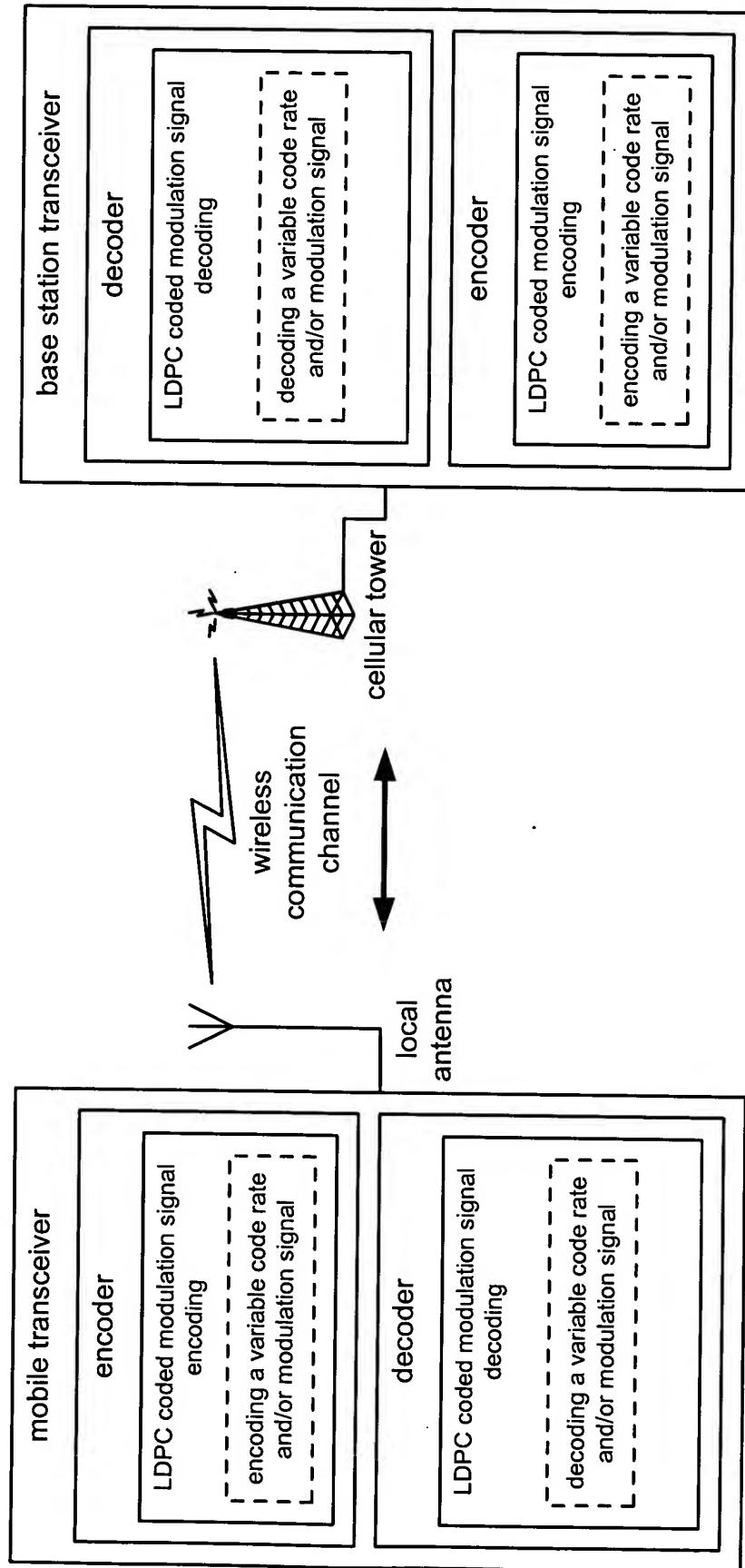
Fig. 1



HDTV (High Definition Television) communication system

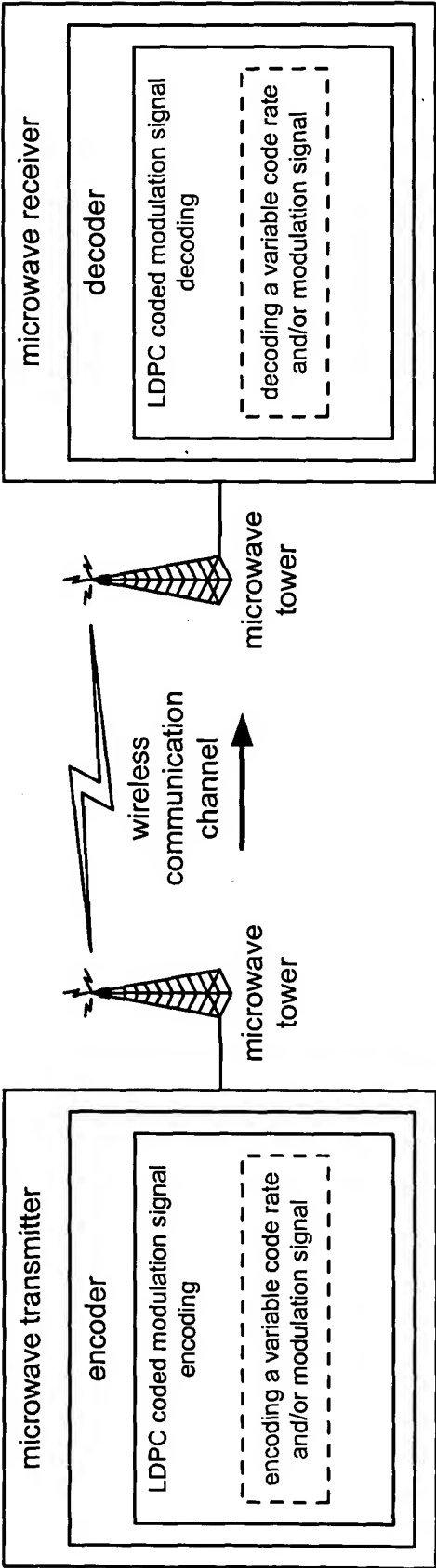
Fig. 2





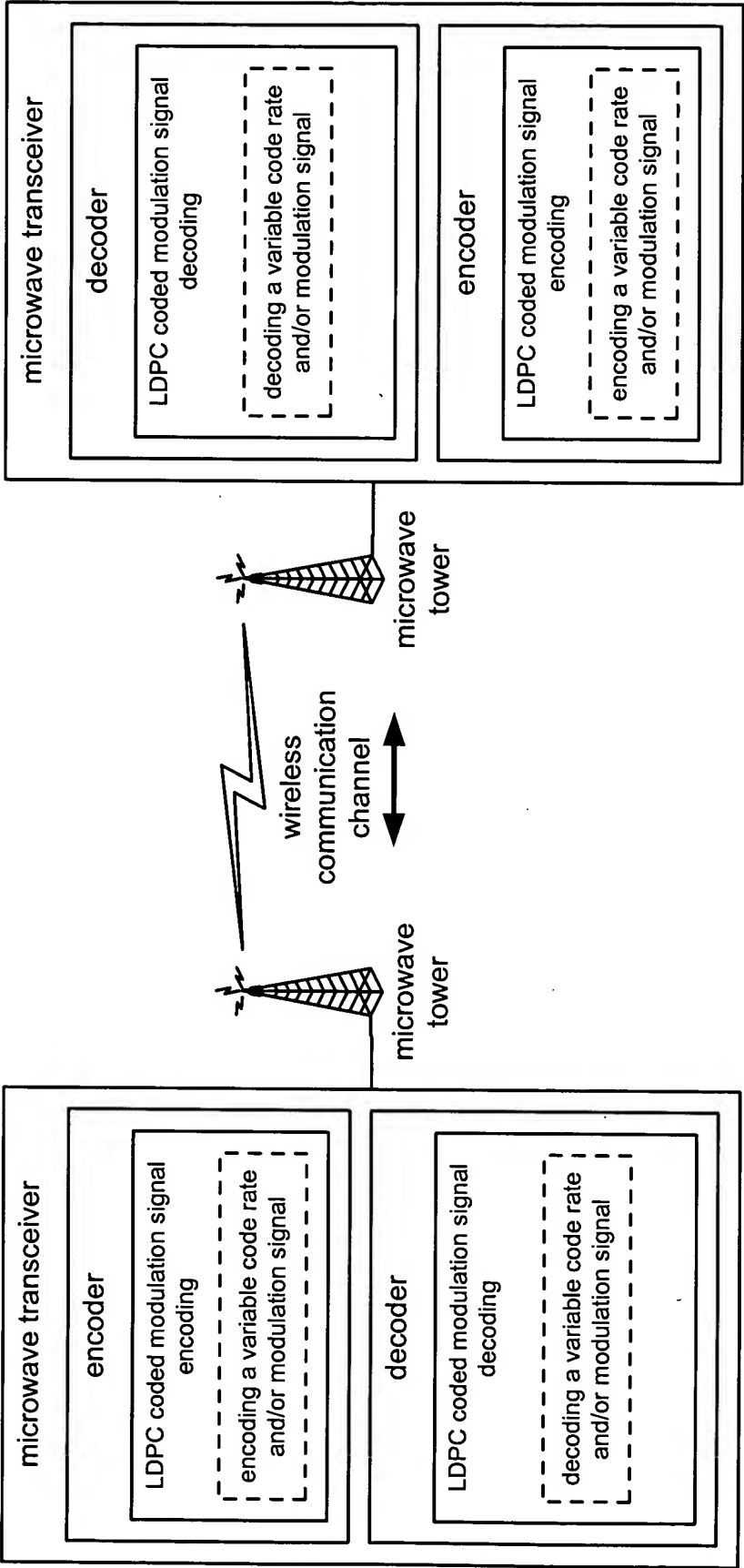
bi-directional cellular communication system

Fig. 4

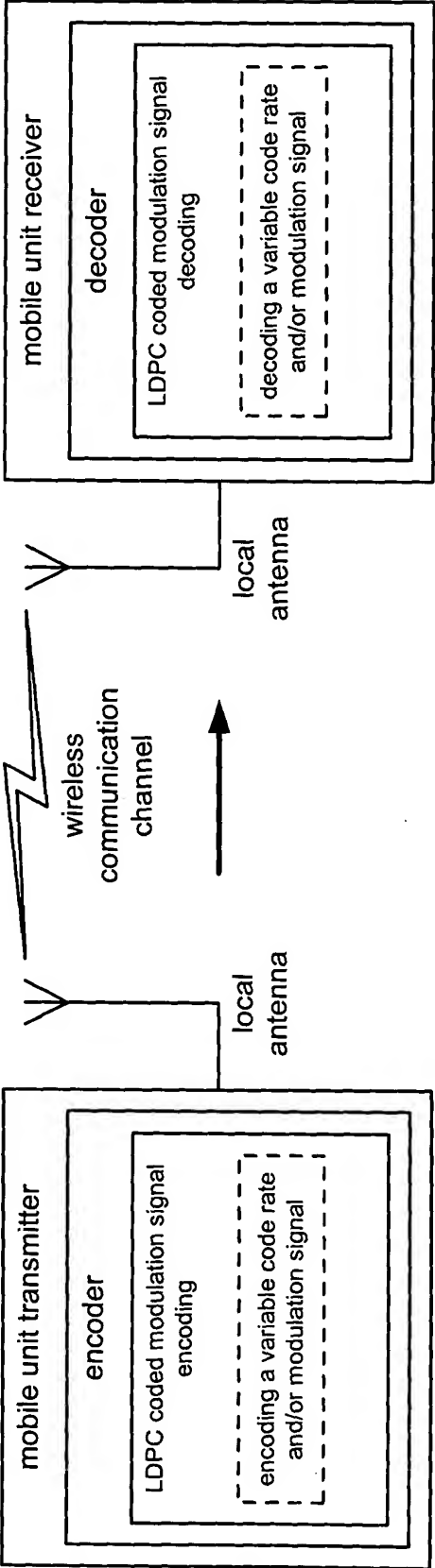


uni-directional microwave communication system

Fig. 5

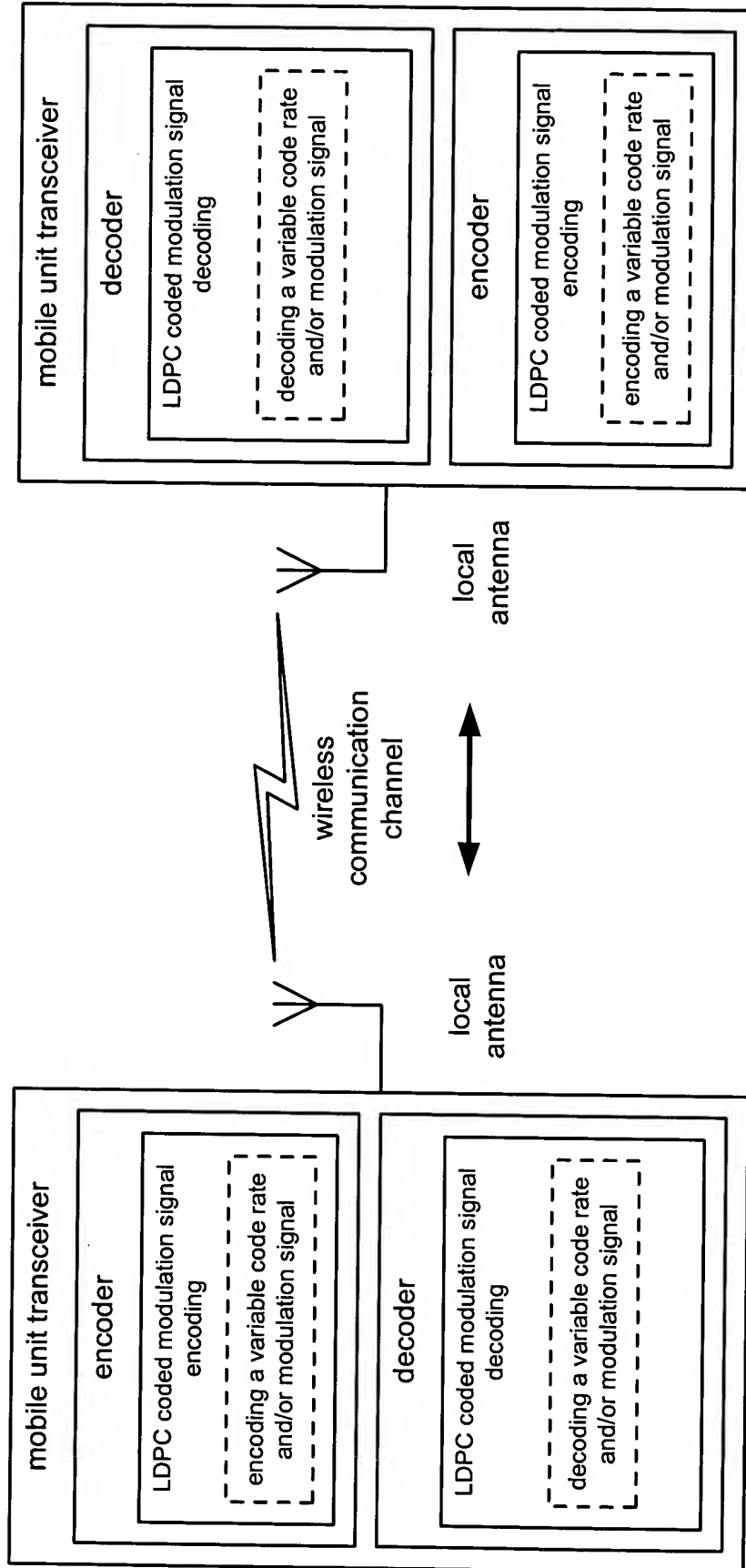


bi-directional microwave communication system
Fig. 6



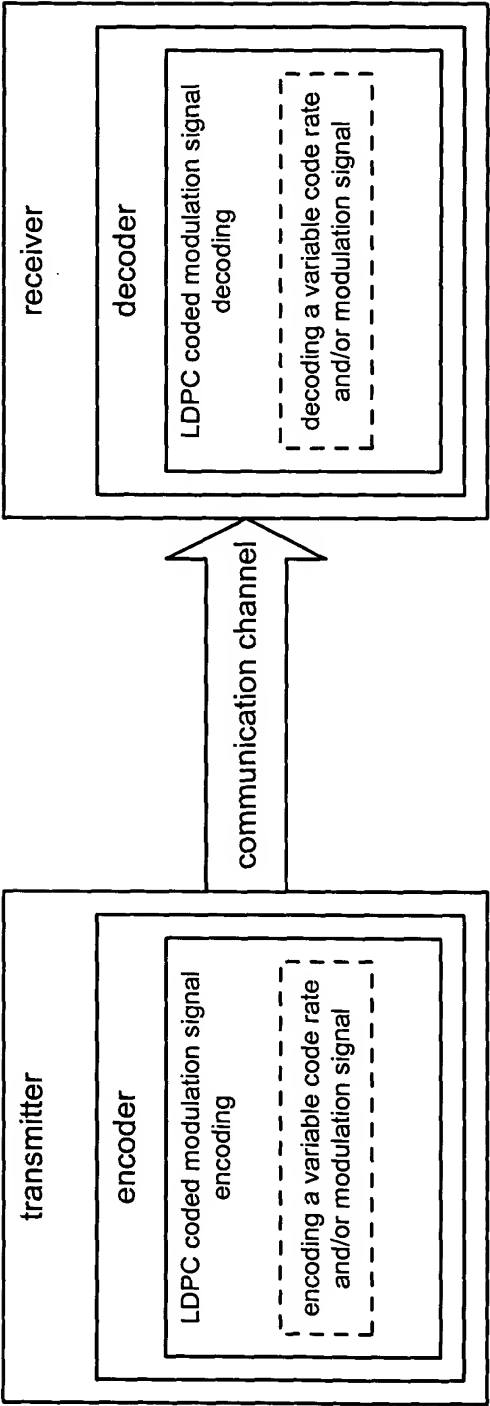
uni-directional point-to-point radio communication system

Fig. 7

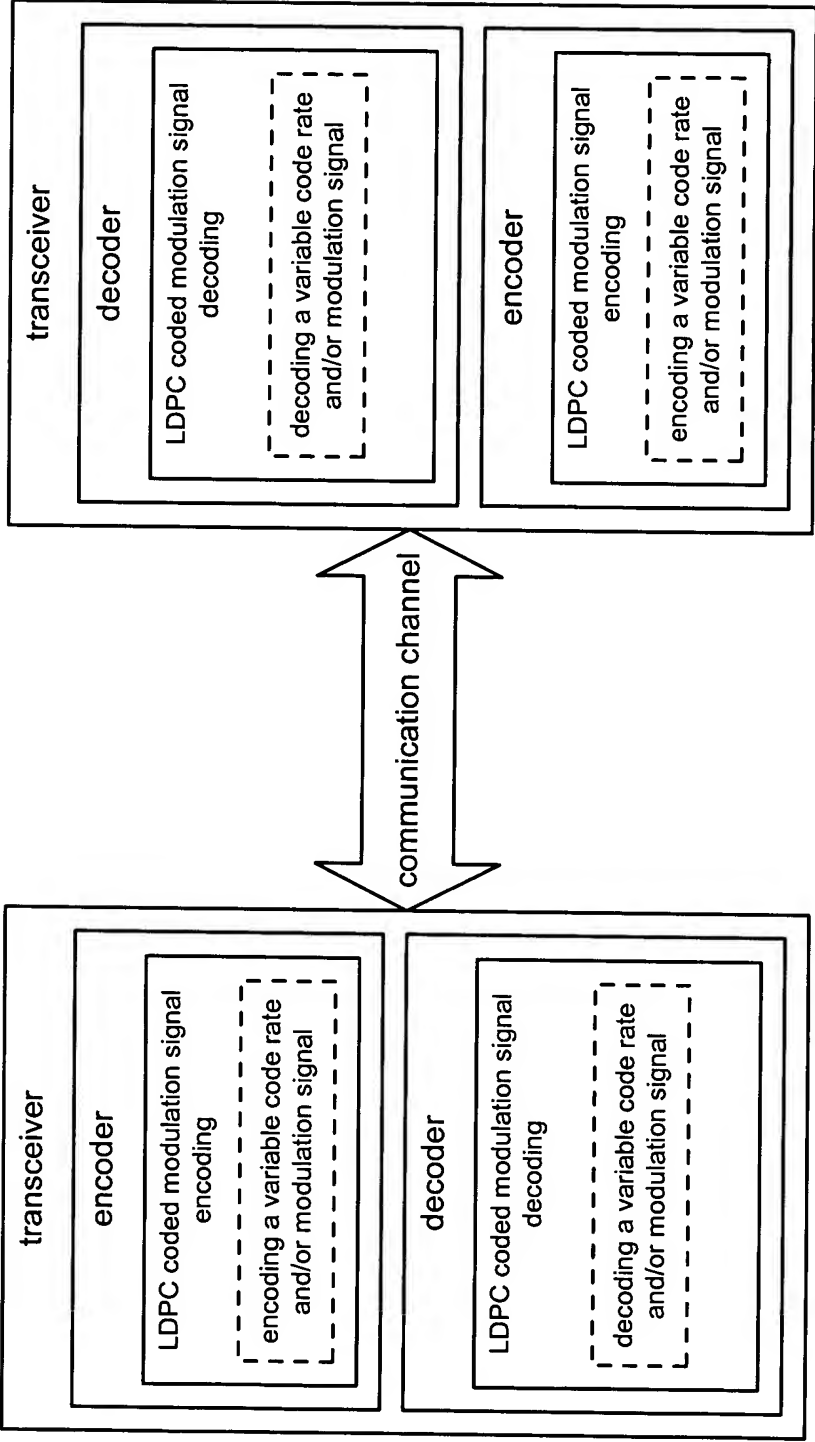


bi-directional point-to-point radio communication system

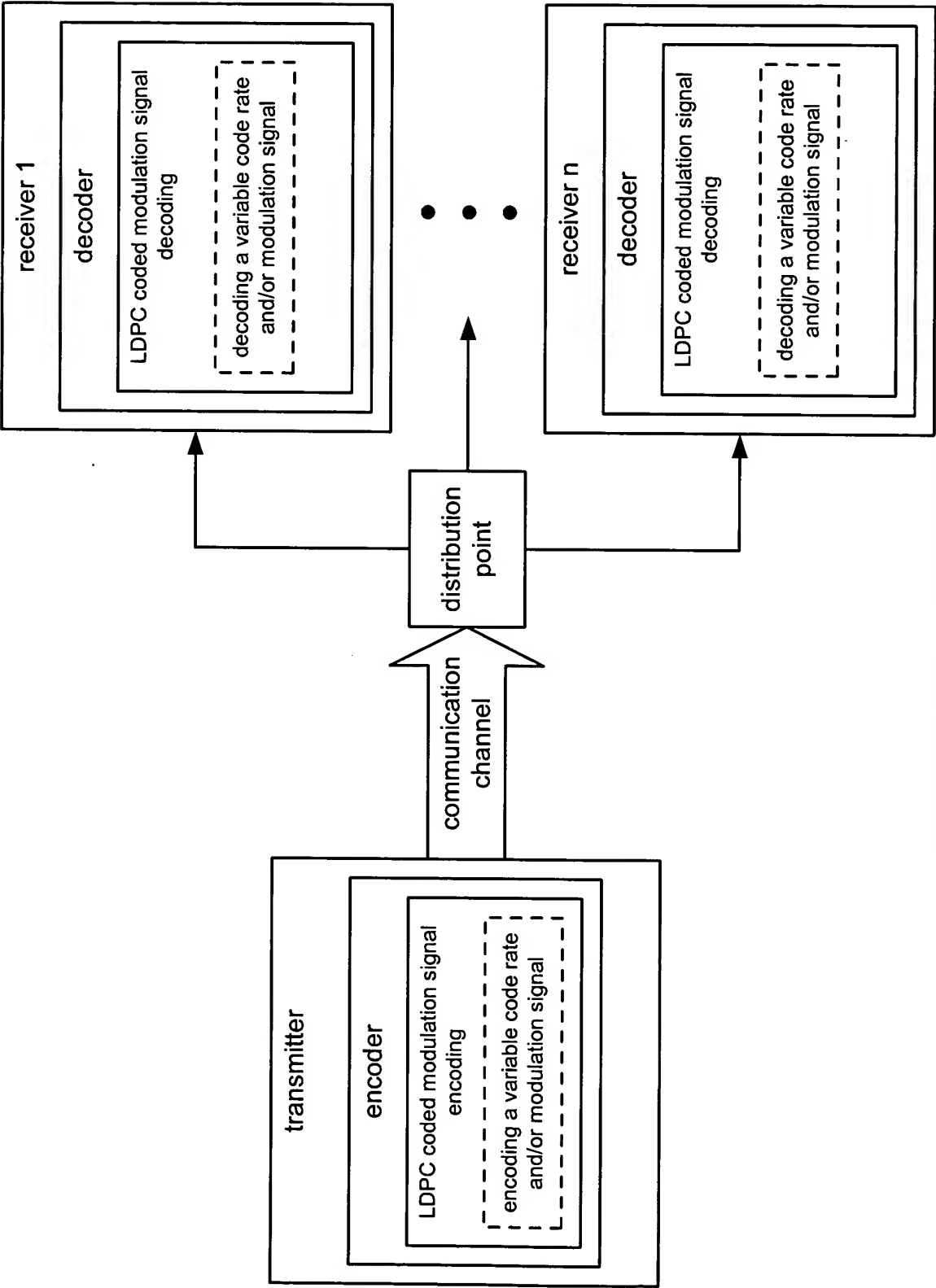
Fig. 8



uni-directional communication system
Fig. 9

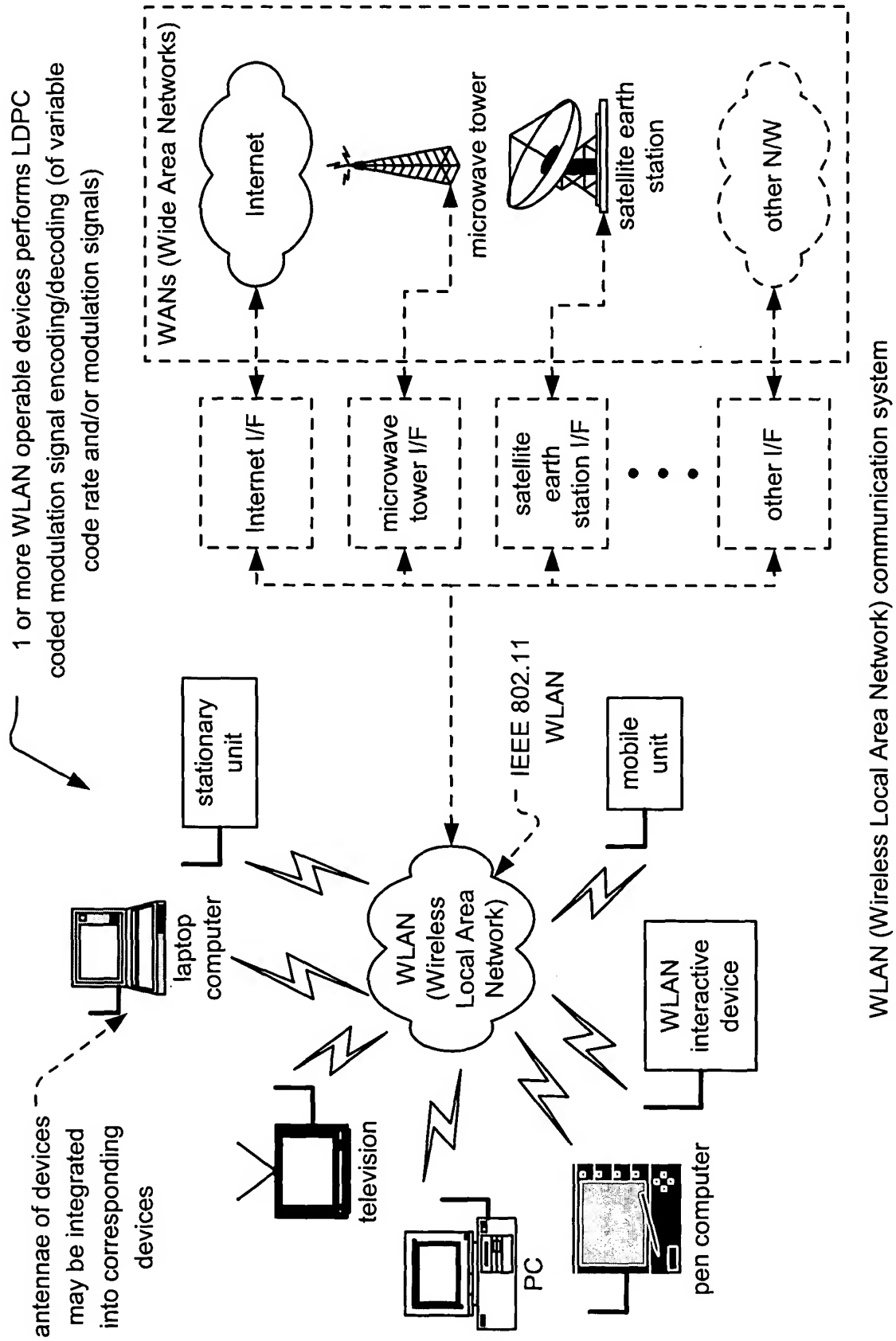


bi-directional communication system
Fig. 10



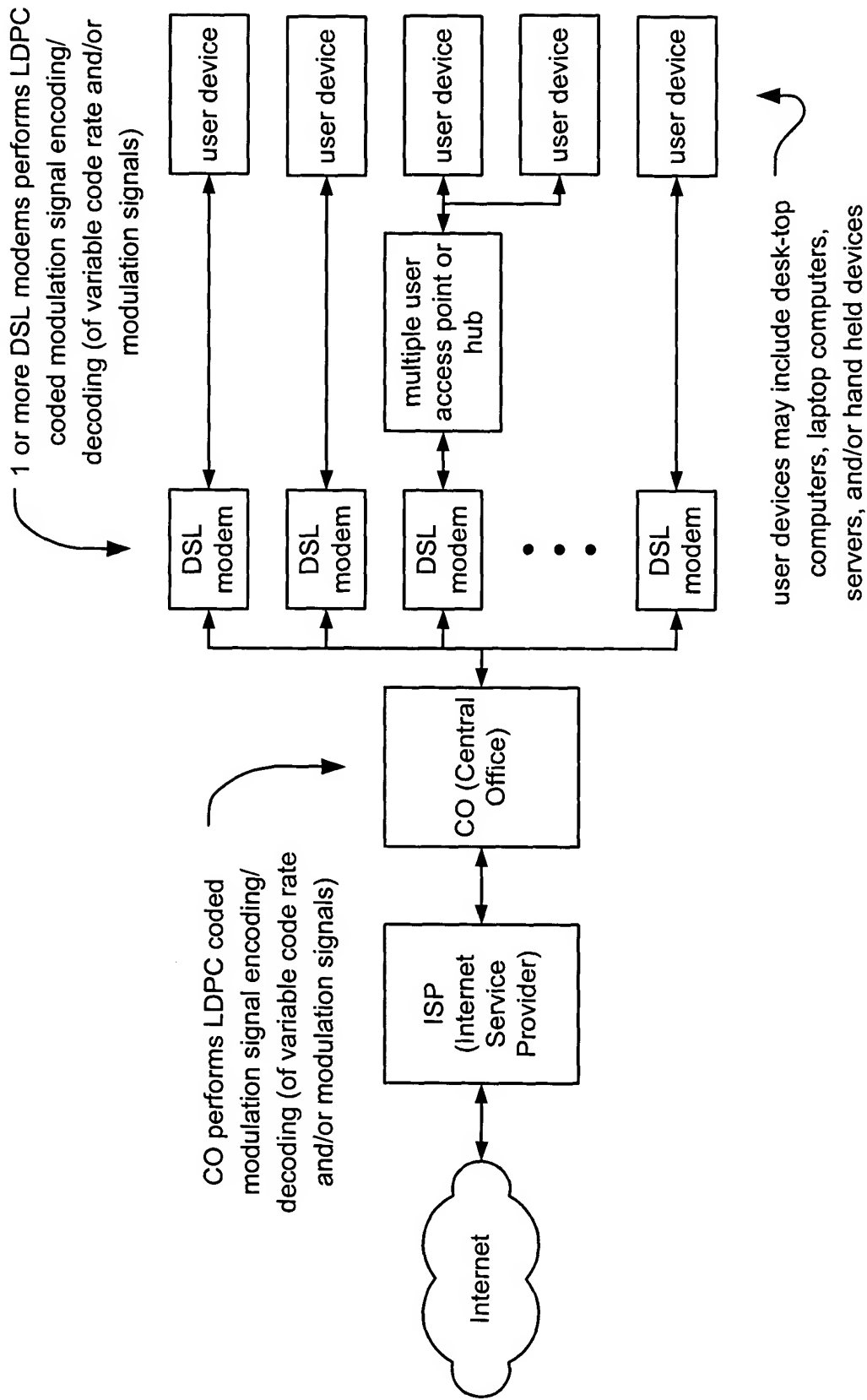
one to many communication system

Fig. 11



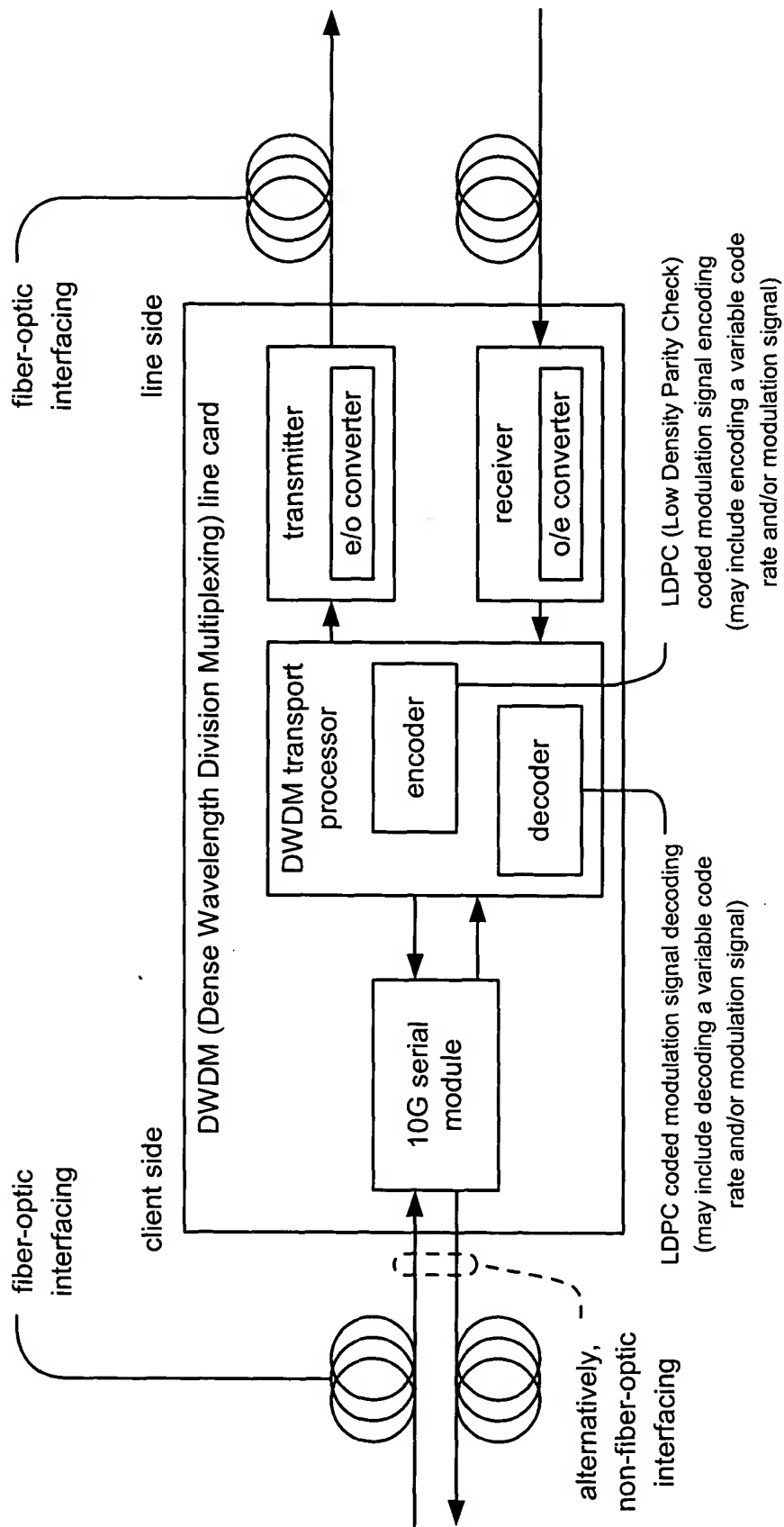
WLAN (Wireless Local Area Network) communication system

Fig. 12



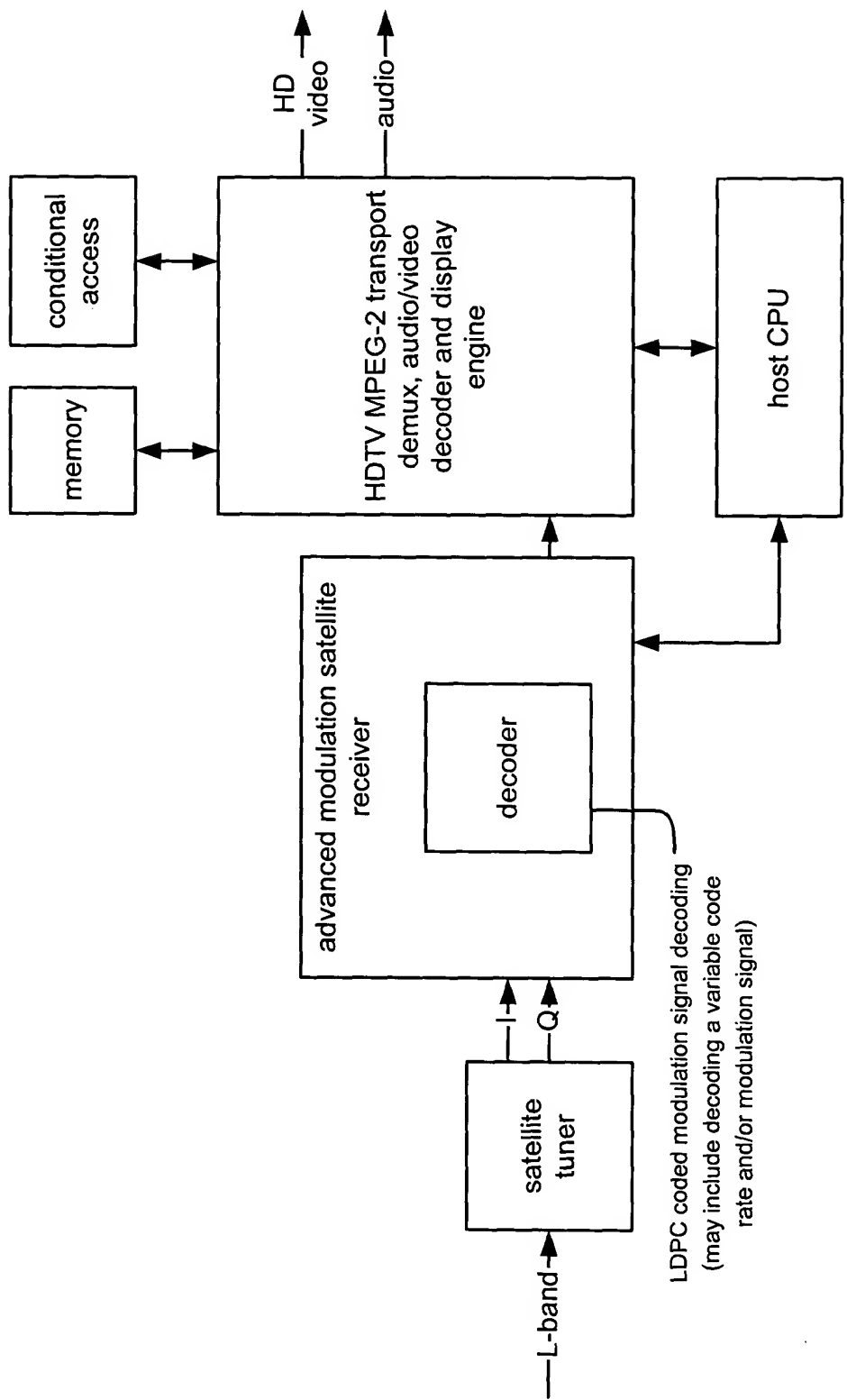
DSL (Digital Subscriber Line) communication system

Fig. 13



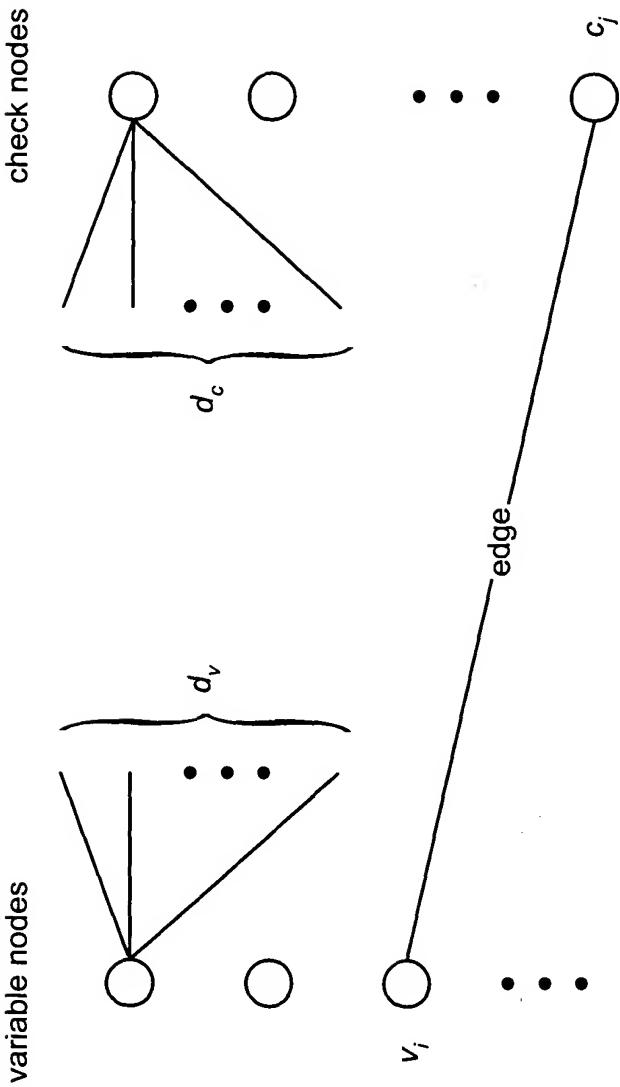
fiber-optic communication system

Fig. 14



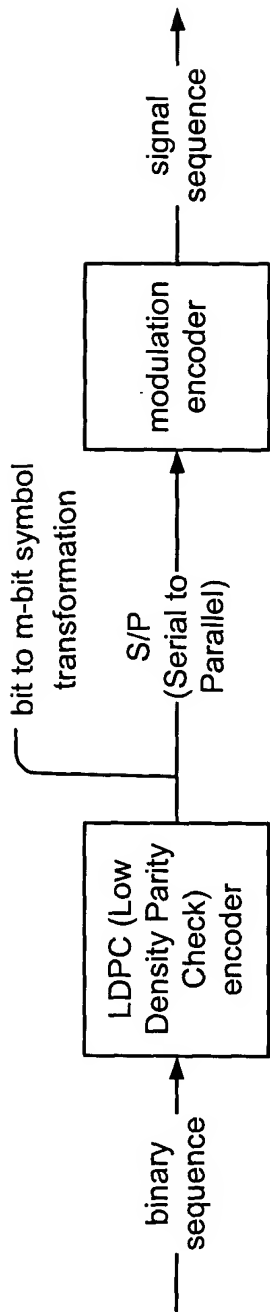
satellite receiver STB (Set Top Box) system

Fig. 15



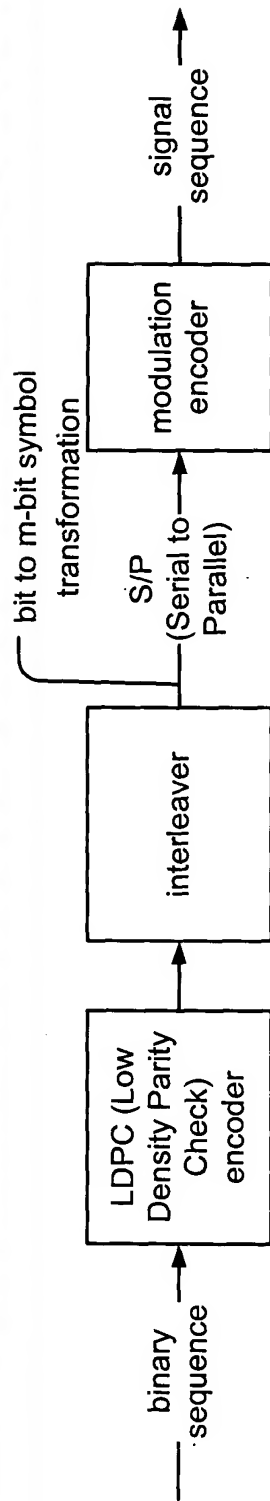
LDPC (Low Density Parity Check) code bipartite graph

Fig. 16



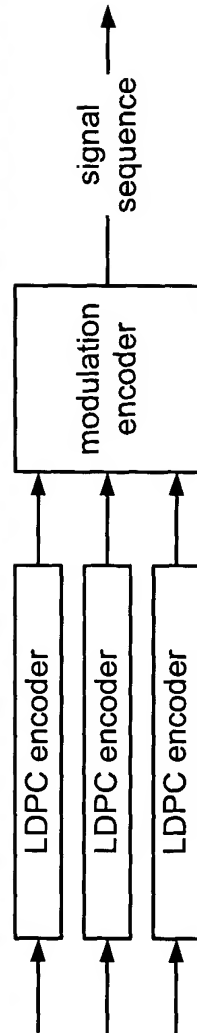
direct combining of LDPC (Low Density Parity Check) coding and modulation

Fig. 17A



BICM (Bit Interleaved Coded Modulation)

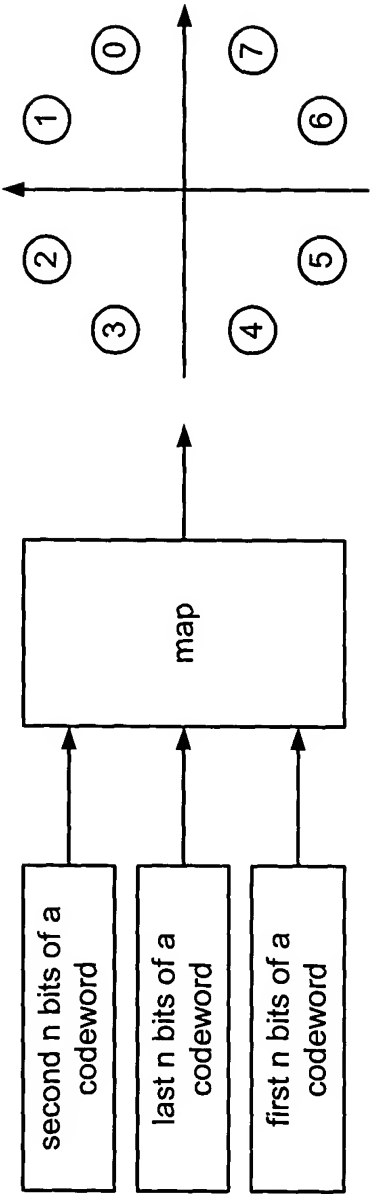
Fig. 17B



multilevel coded modulation

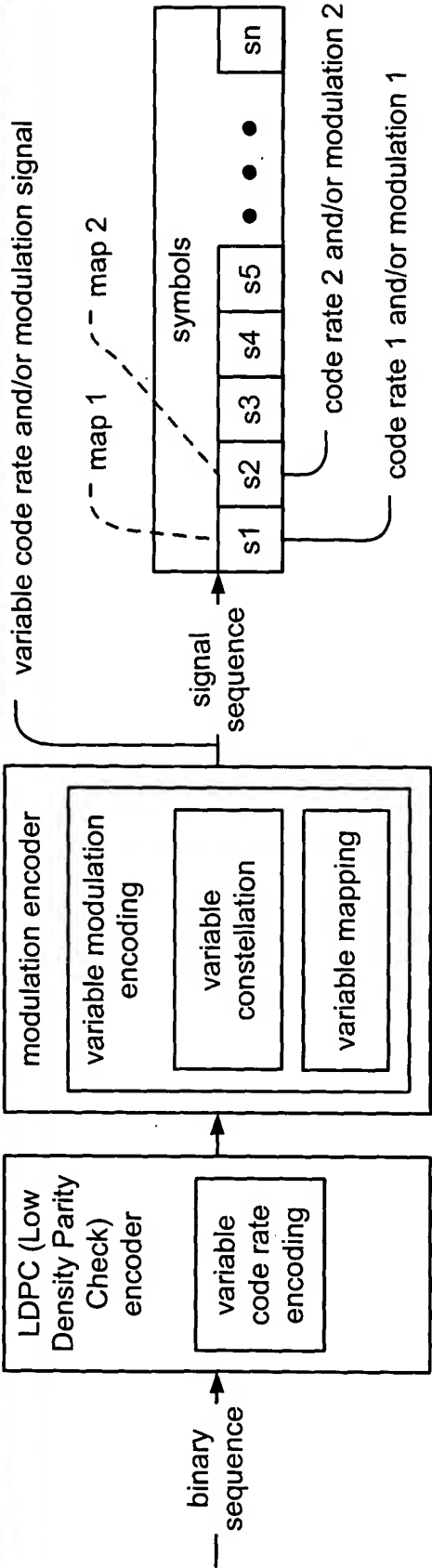
Fig. 17C

$$\begin{aligned} \text{Map}(000) &= 0; \text{Map}(001) = 1; \text{Map}(101) = 2; \text{Map}(100) = 3; \\ \text{Map}(110) &= 4; \text{Map}(111) = 5; \text{Map}(011) = 6; \text{Map}(010) = 7 \end{aligned} \quad (\text{EQ 1})$$



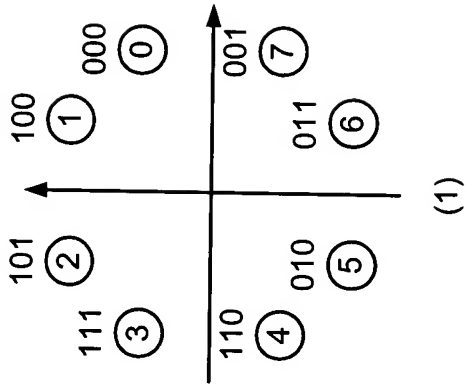
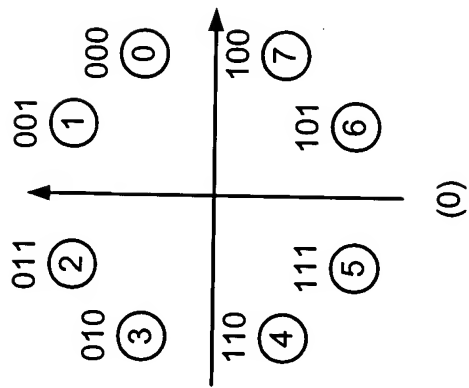
HNS (Hughes Network System) proposal to DVB (Digital Video Broadcasting Project) standard

Fig. 18A

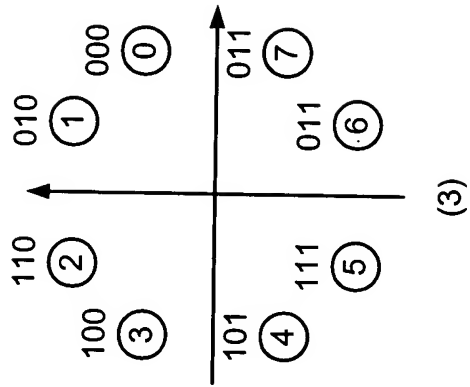
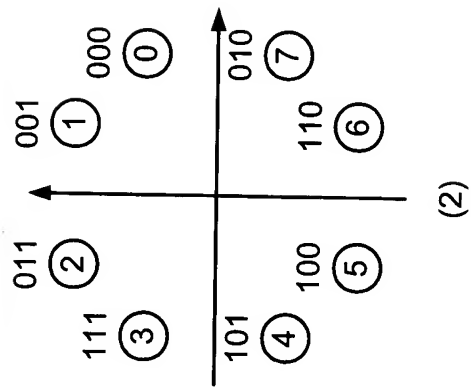


LDPC (Low Density Parity Check) coded modulation signal encoding

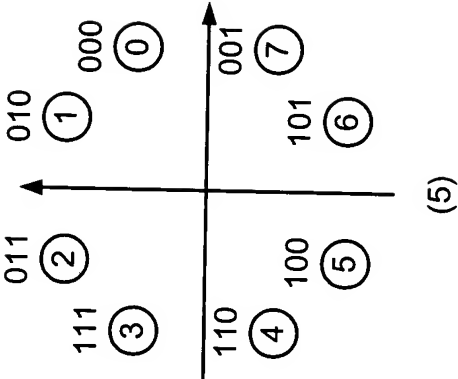
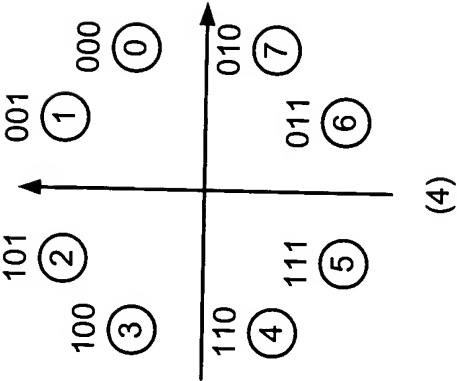
Fig. 18B



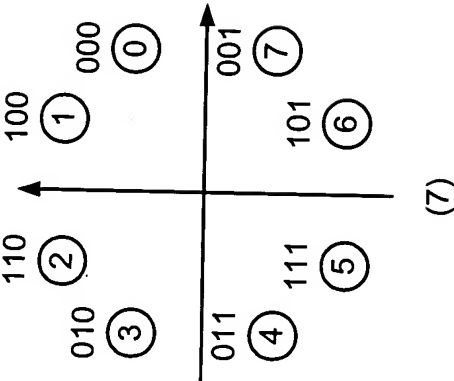
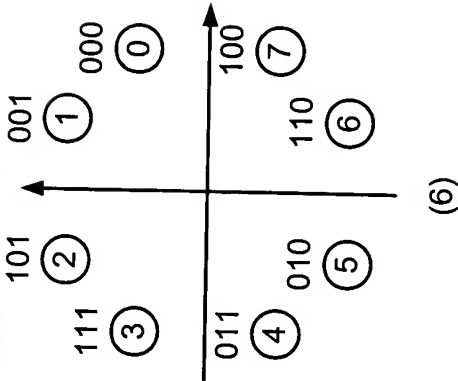
map 0 and map 1
Fig. 19A



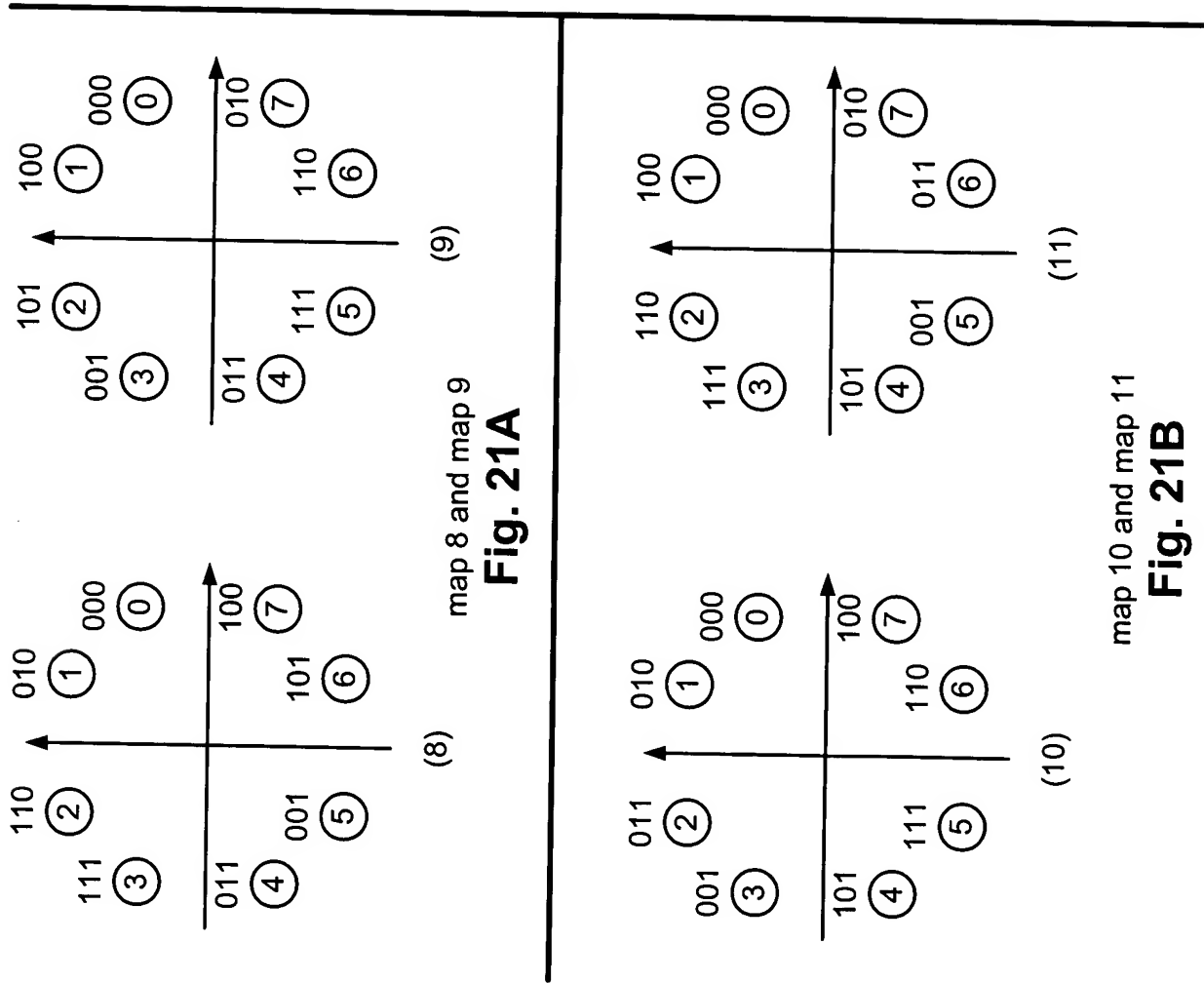
map 2 and map 3
Fig. 19B



map 4 and map 5
Fig. 20A

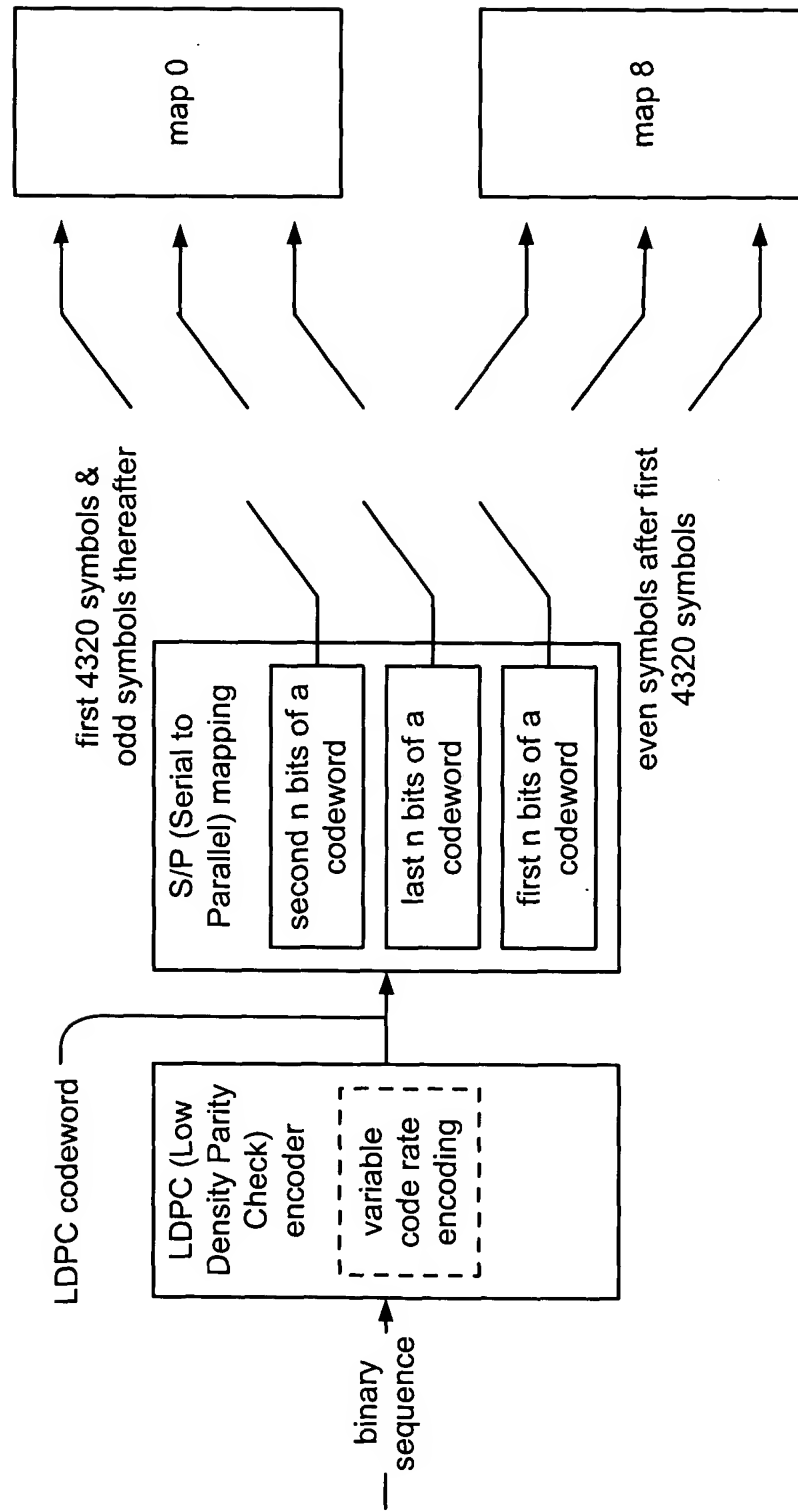


map 6 and map 7
Fig. 20B



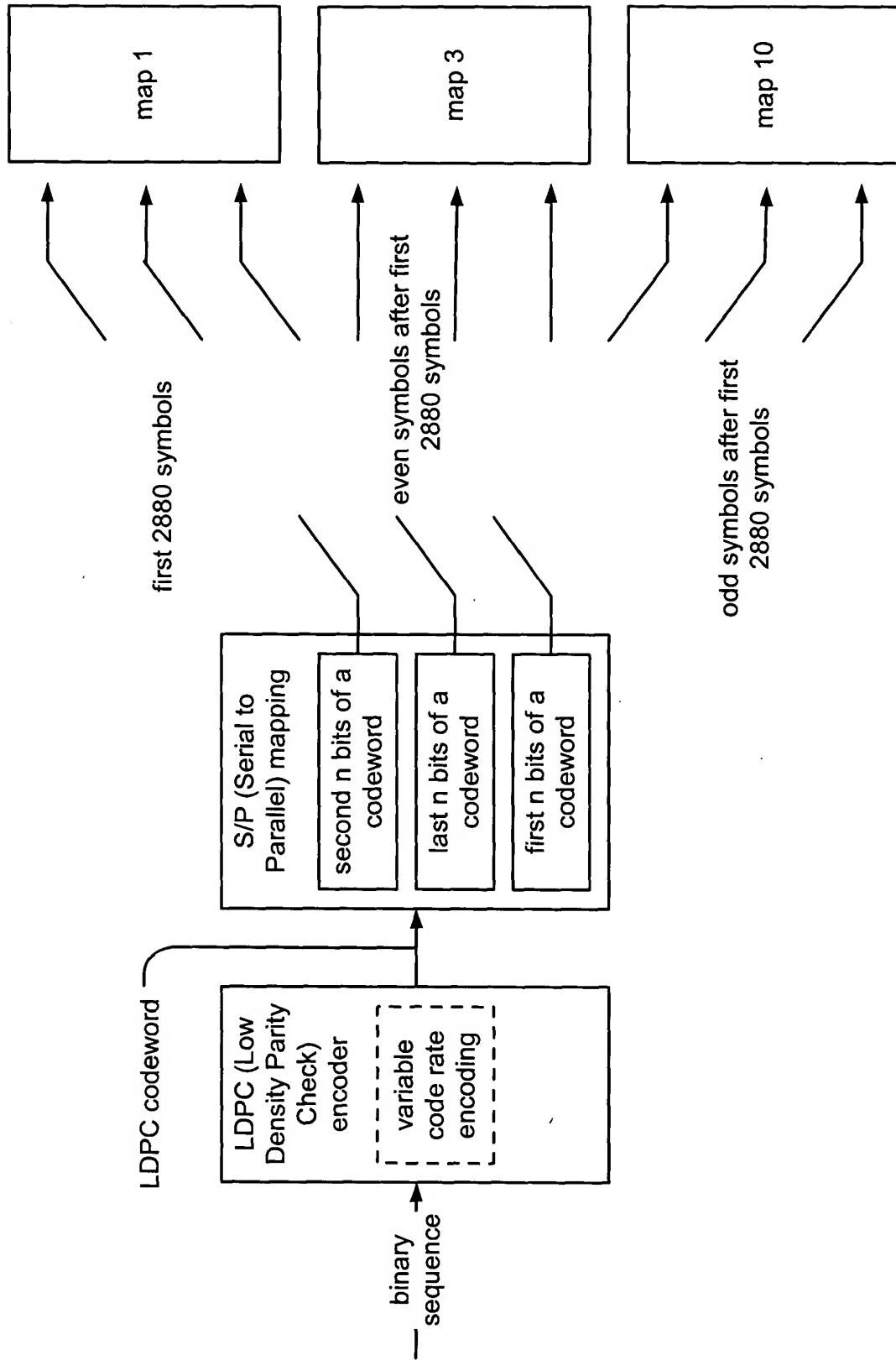
map number	# weak points at MSB	# weak points at ISB	# weak points at LSB
0	2	2	4
1	2	2	4
2	2	4	2
3	2	4	2
4	2	2	4
5	2	2	4
6	4	2	2
7	4	2	2
8	4	2	2
9	4	2	2
10	2	4	2
11	2	4	2

Table I
Fig. 21C



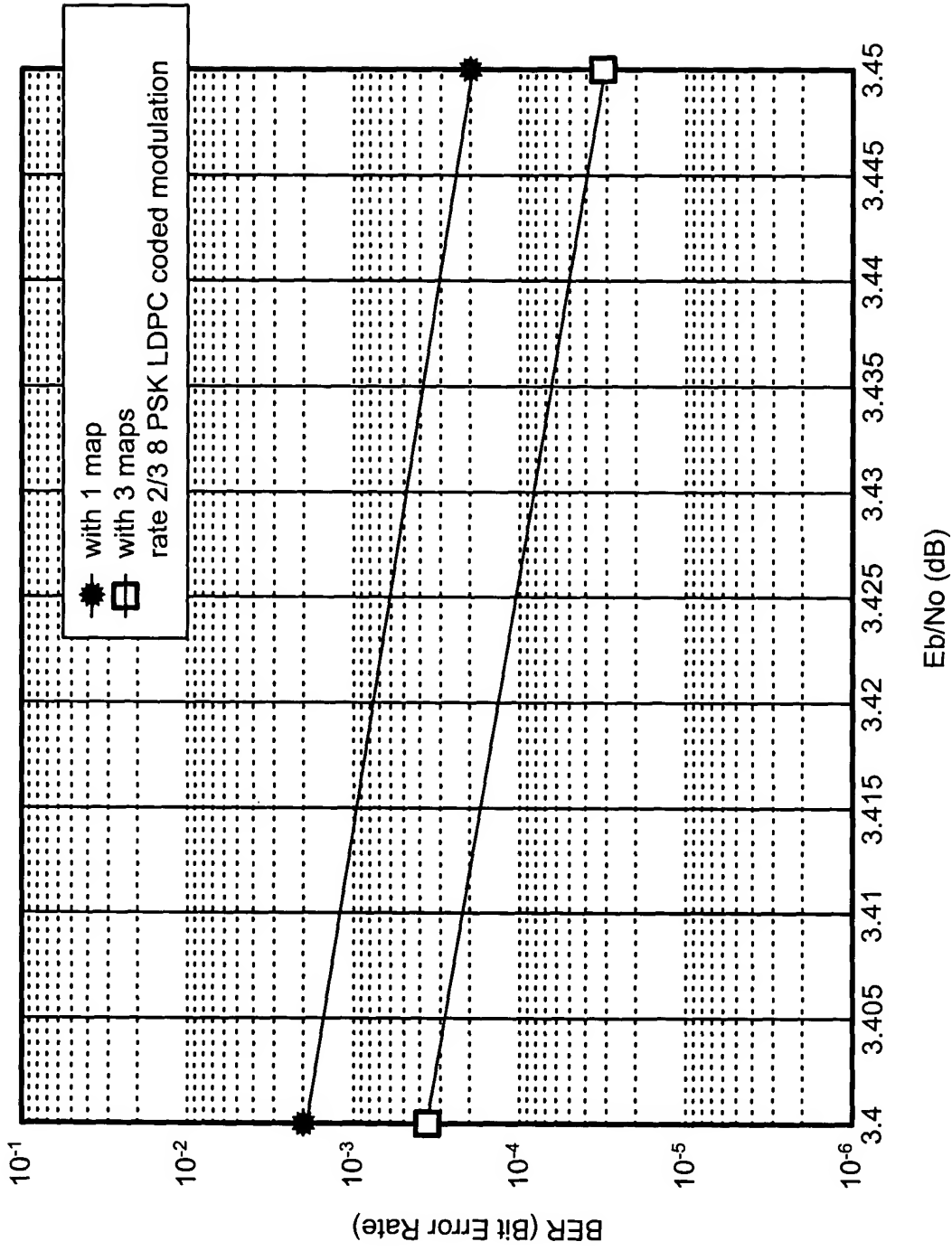
variable signal mapping LDPC (Low Density Parity Check) coded modulation system

Fig. 22



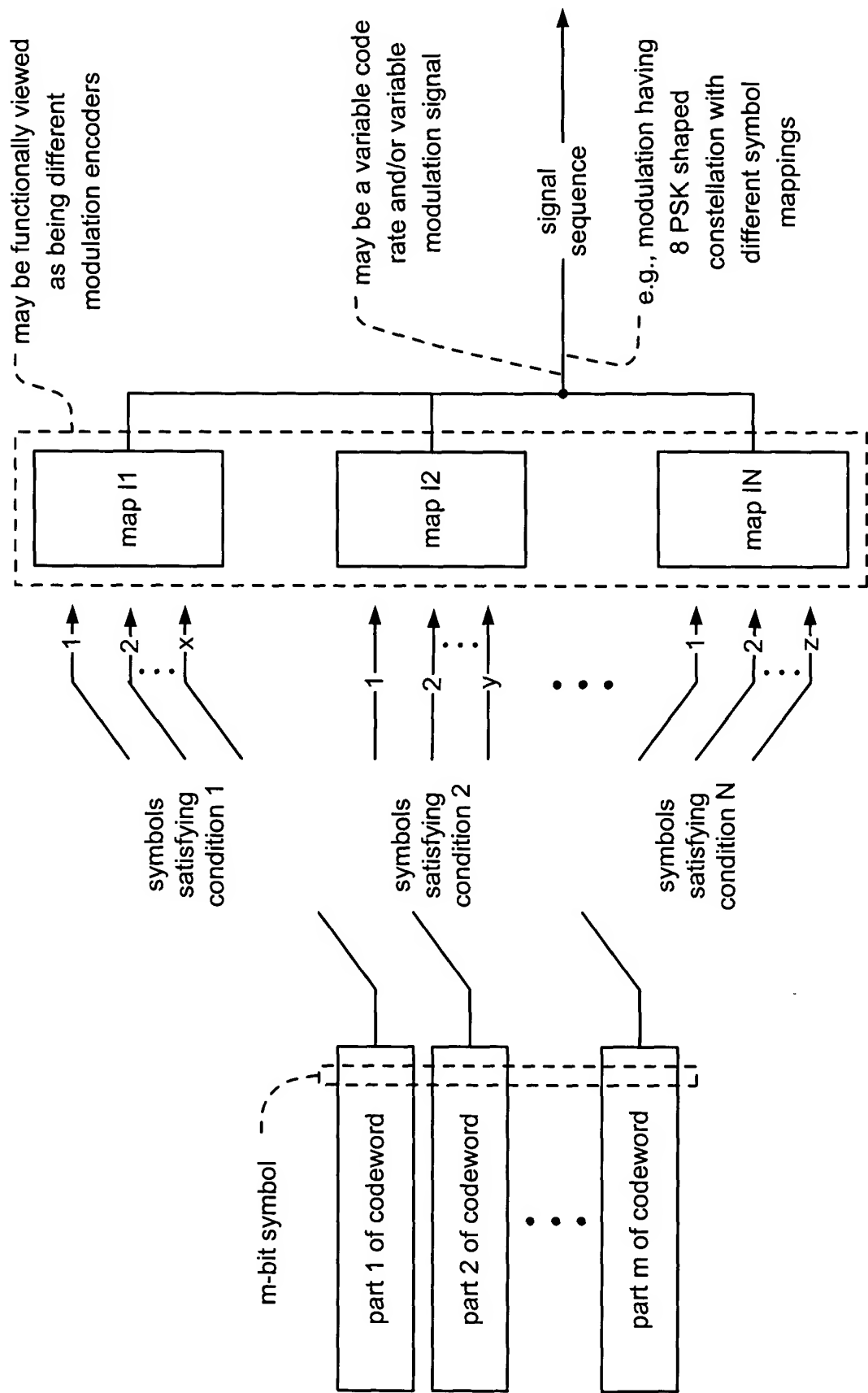
variable signal mapping LDPC (Low Density Parity Check) coded modulation system with code C₂

Fig. 23



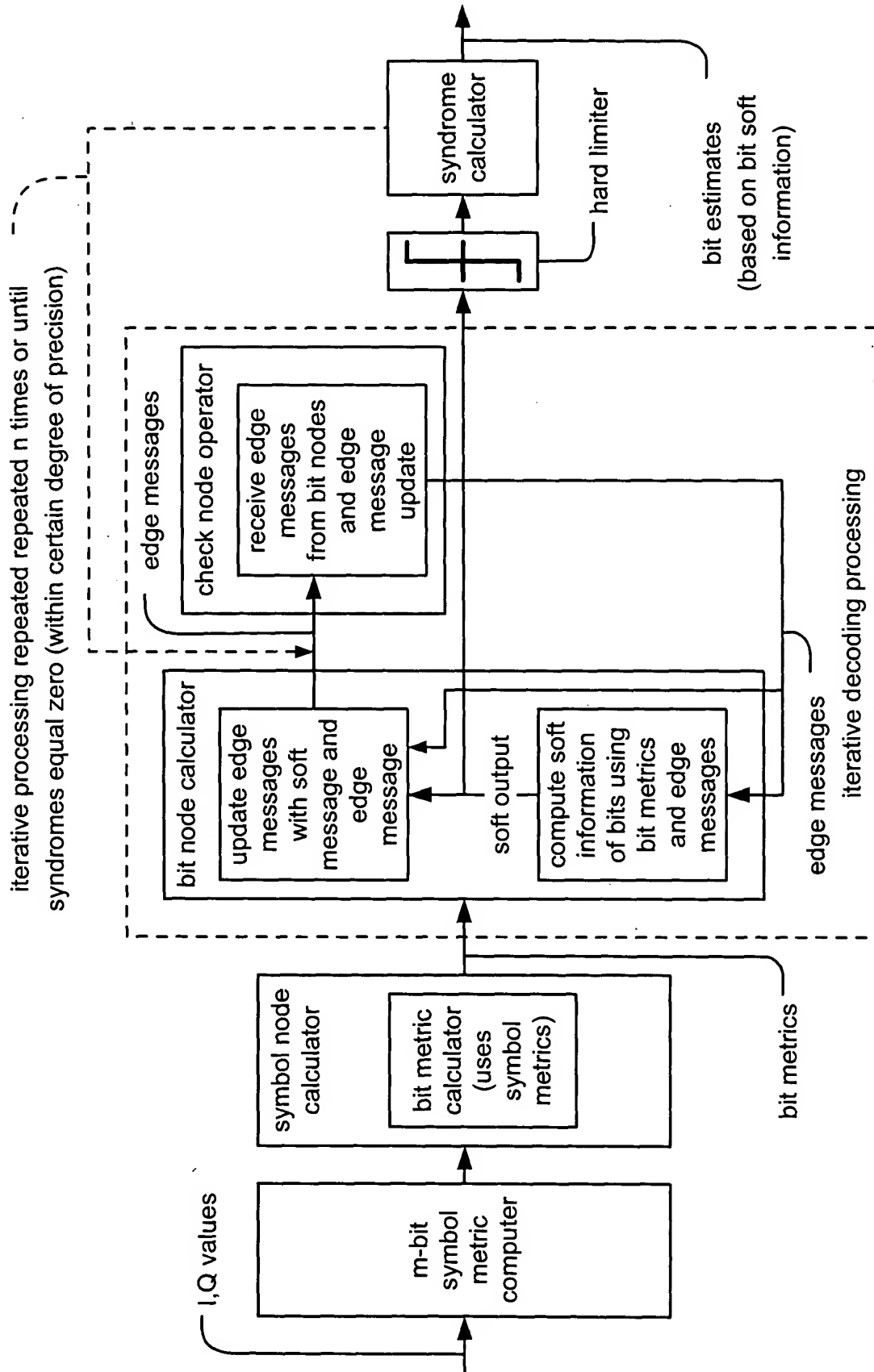
performance comparison of single map vs. multiple maps (1 map vs. 3 maps)

Fig. 24



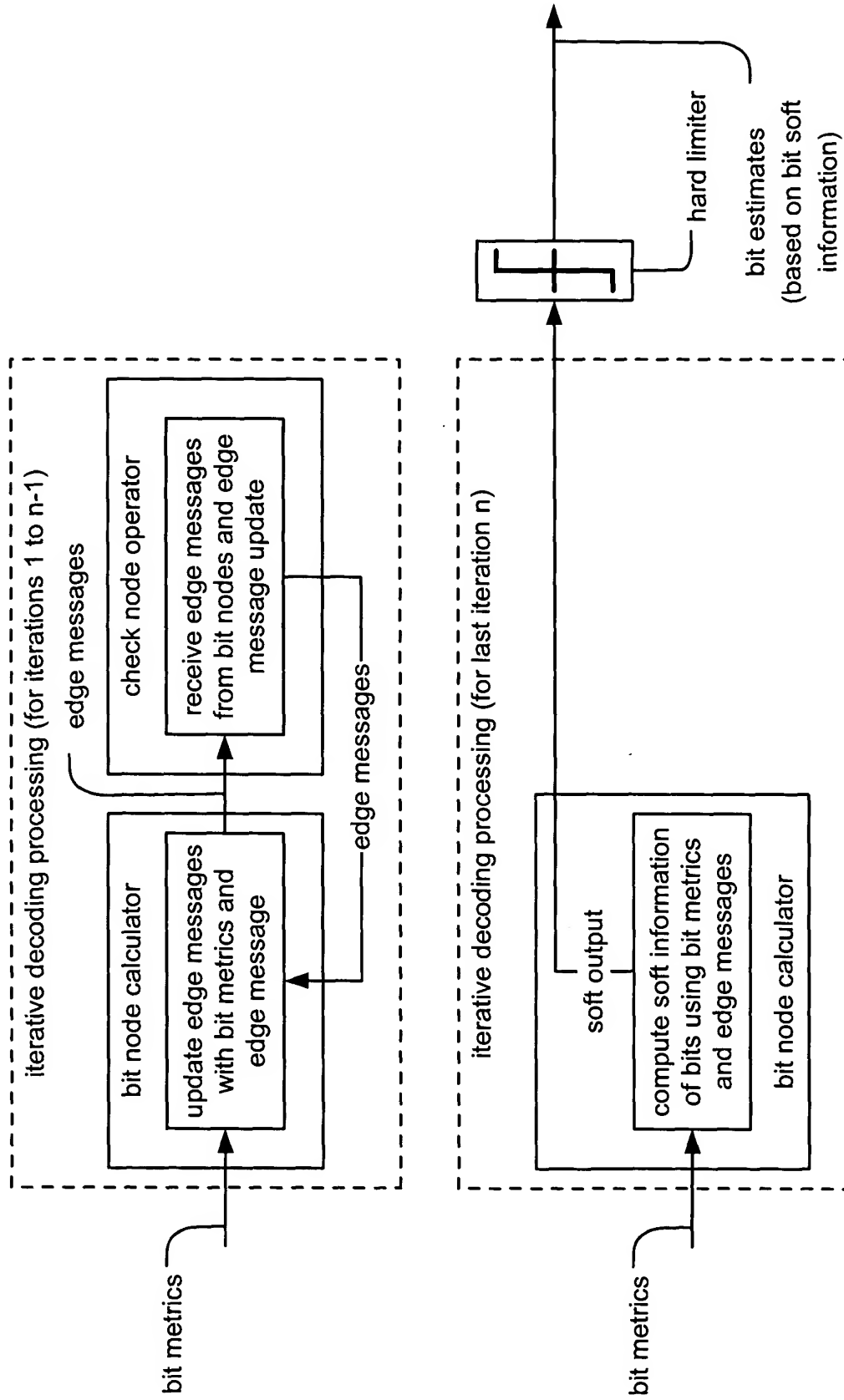
variable signal mapping LDPC (Low Density Parity Check) coded modulation system

Fig. 25



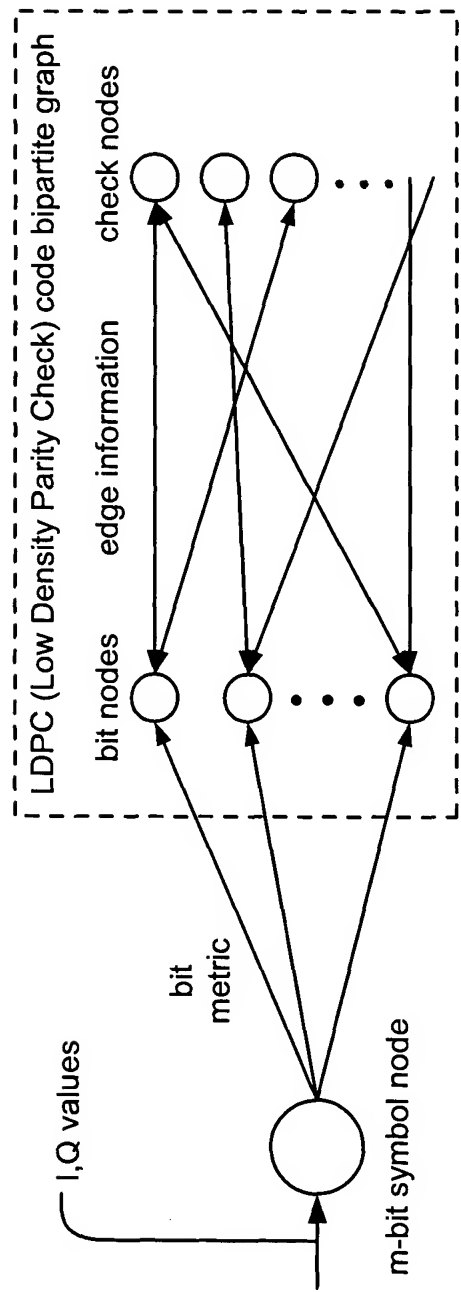
LDPC (Low Density Parity Check) coded modulation decoding functionality using bit metric

Fig. 26



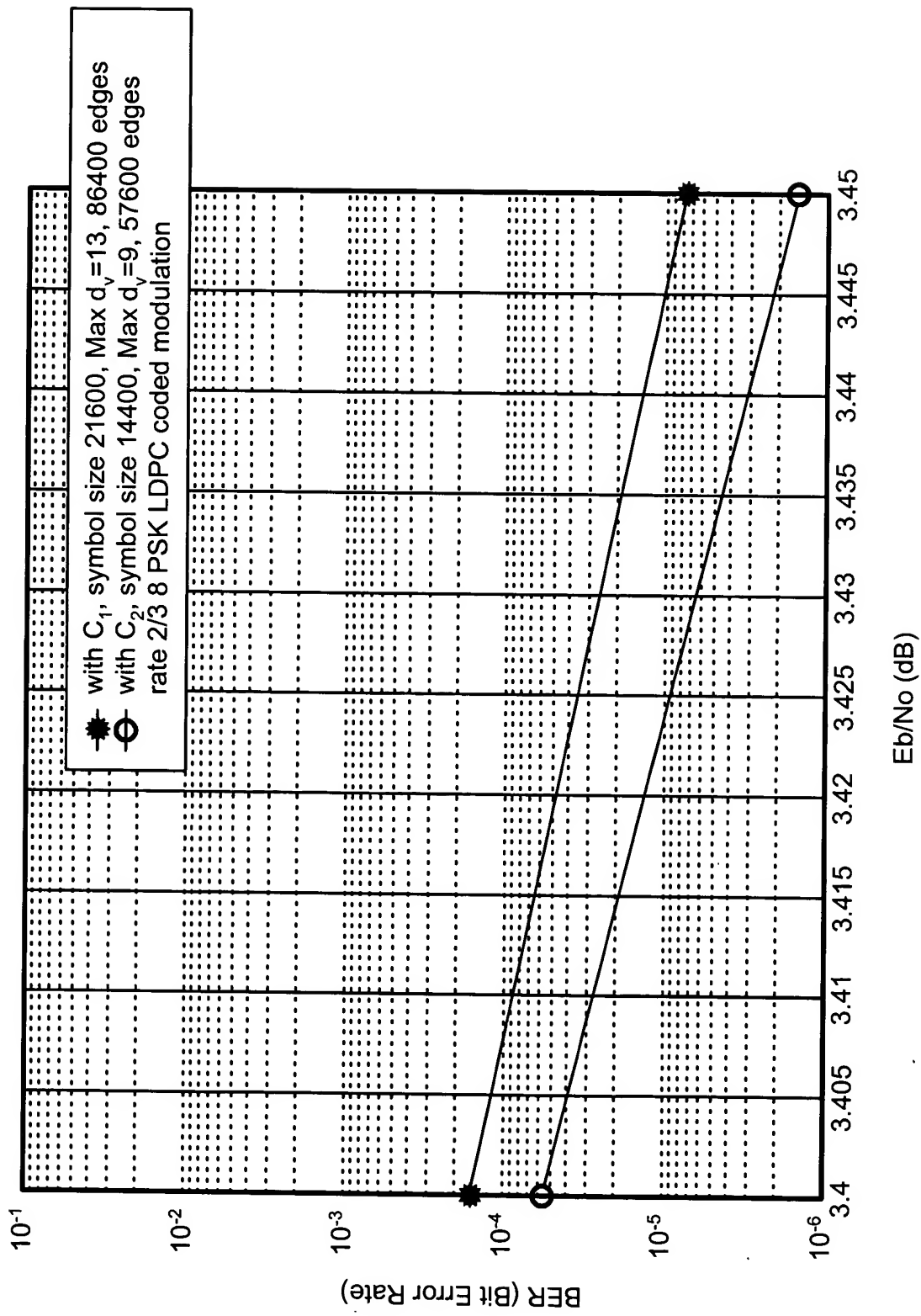
alternative LDPC coded modulation decoding functionality using bit metric (when performing n number of iterations)

Fig. 27



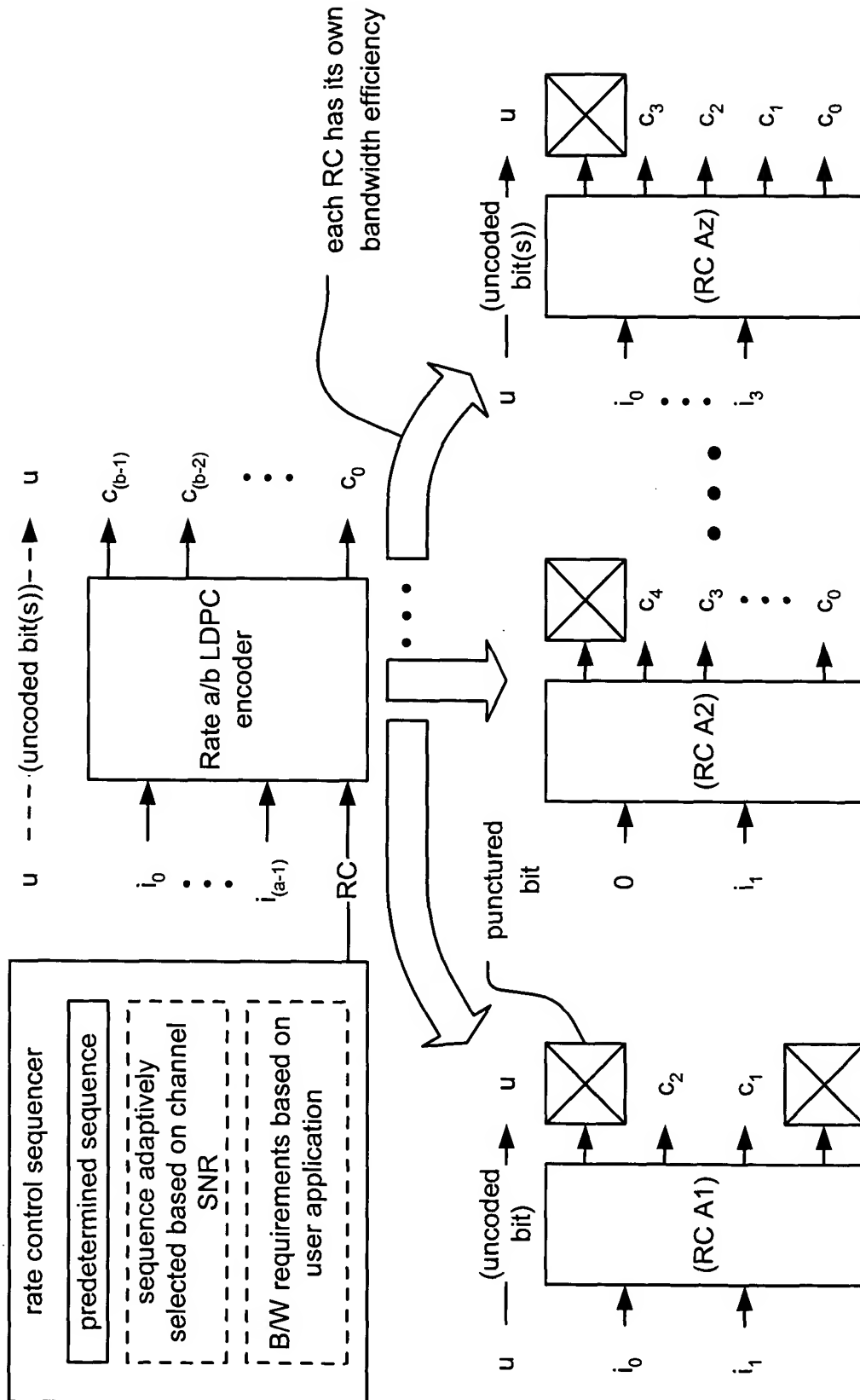
bit decoding using bit metric (shown with respect to LDPC (Low Density Parity Check) code bipartite graph)

Fig. 28



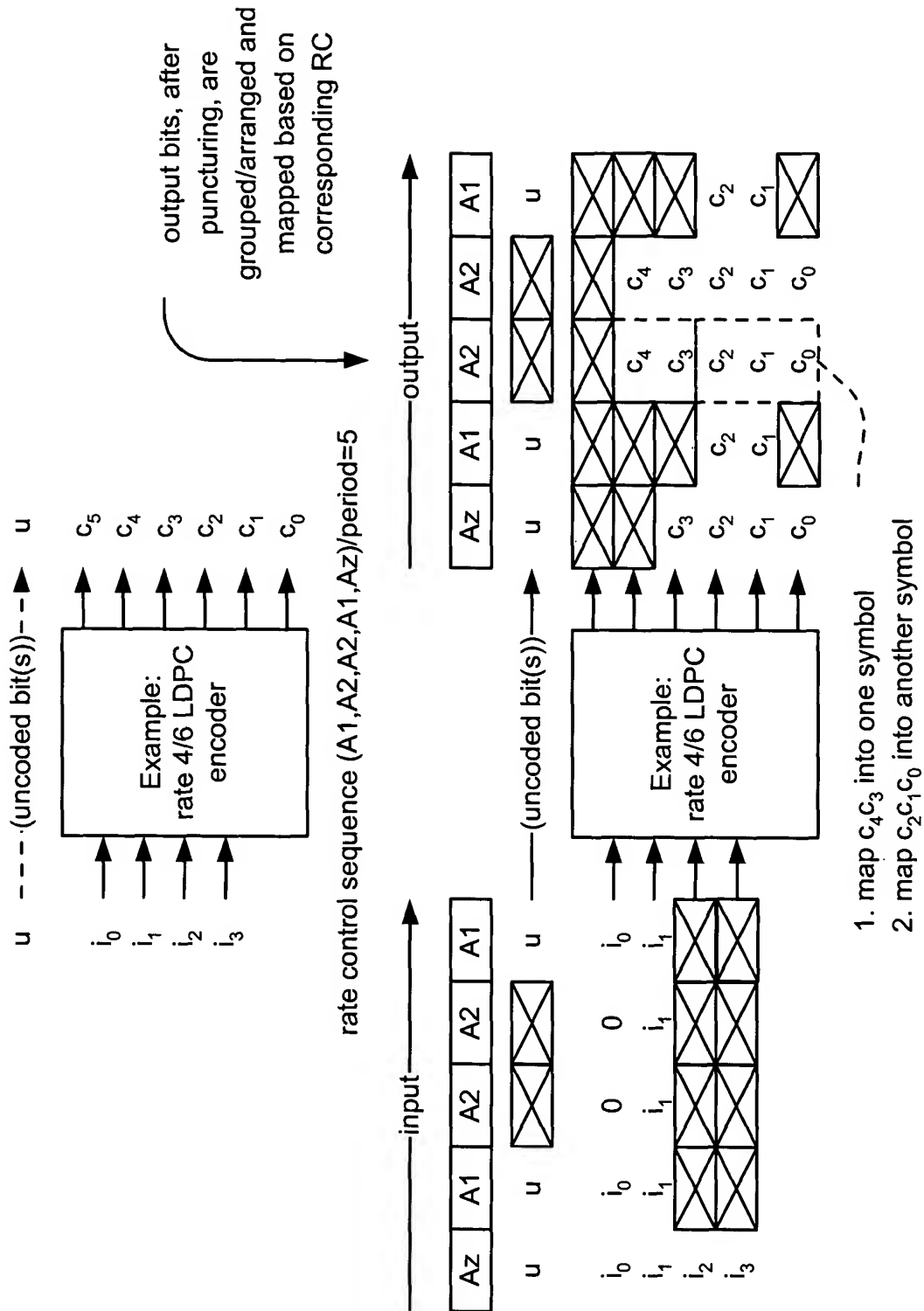
performance of LDPC coded modulation decoding of different symbol size
(1. block with 21600 symbols, 3 bits per symbol and 2. block with 14400 symbols, 3 bits per symbol)

Fig. 29



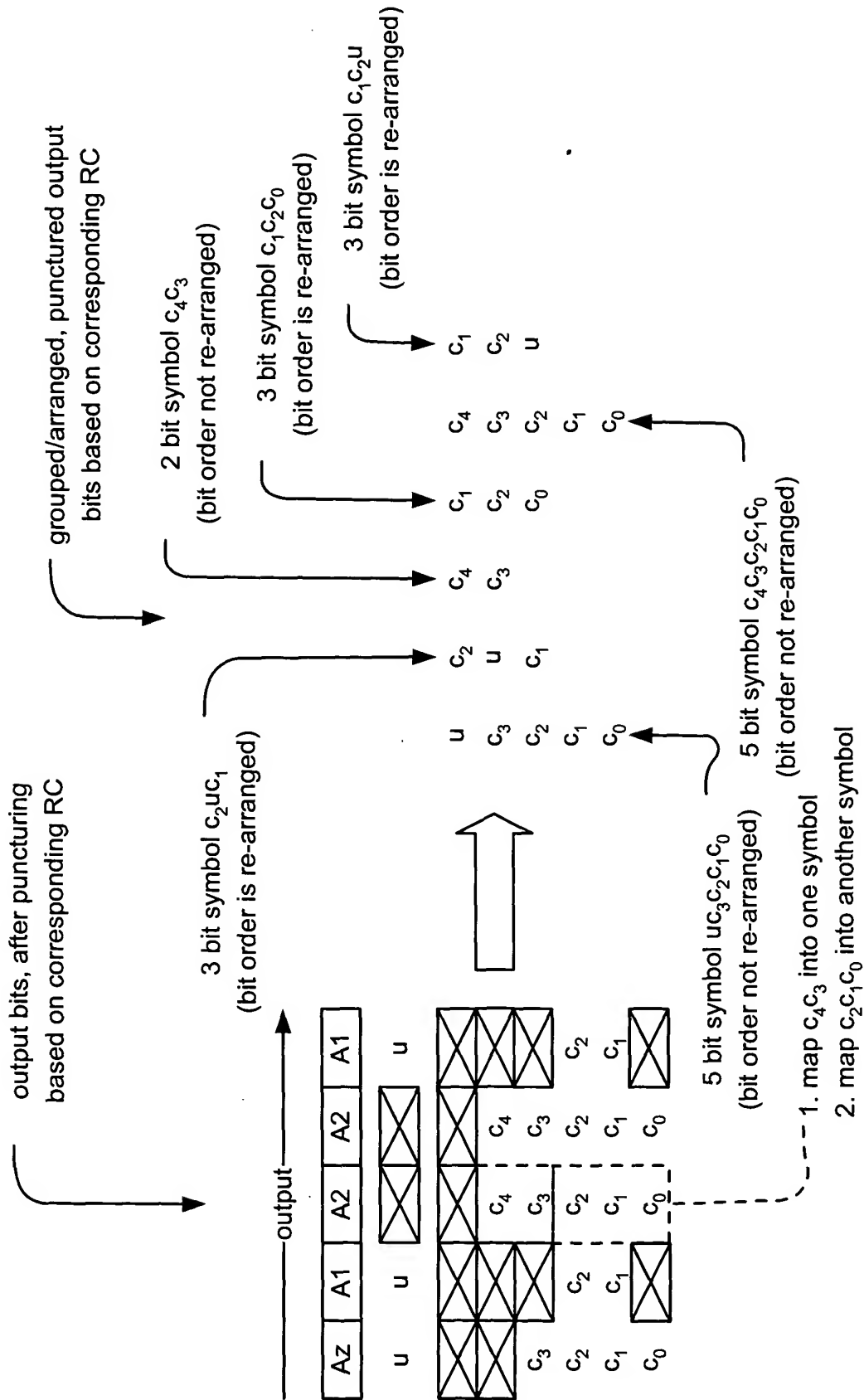
LDPC encoder using puncturing and rate control sequencer to support multiple LDPC encoders

Fig. 30



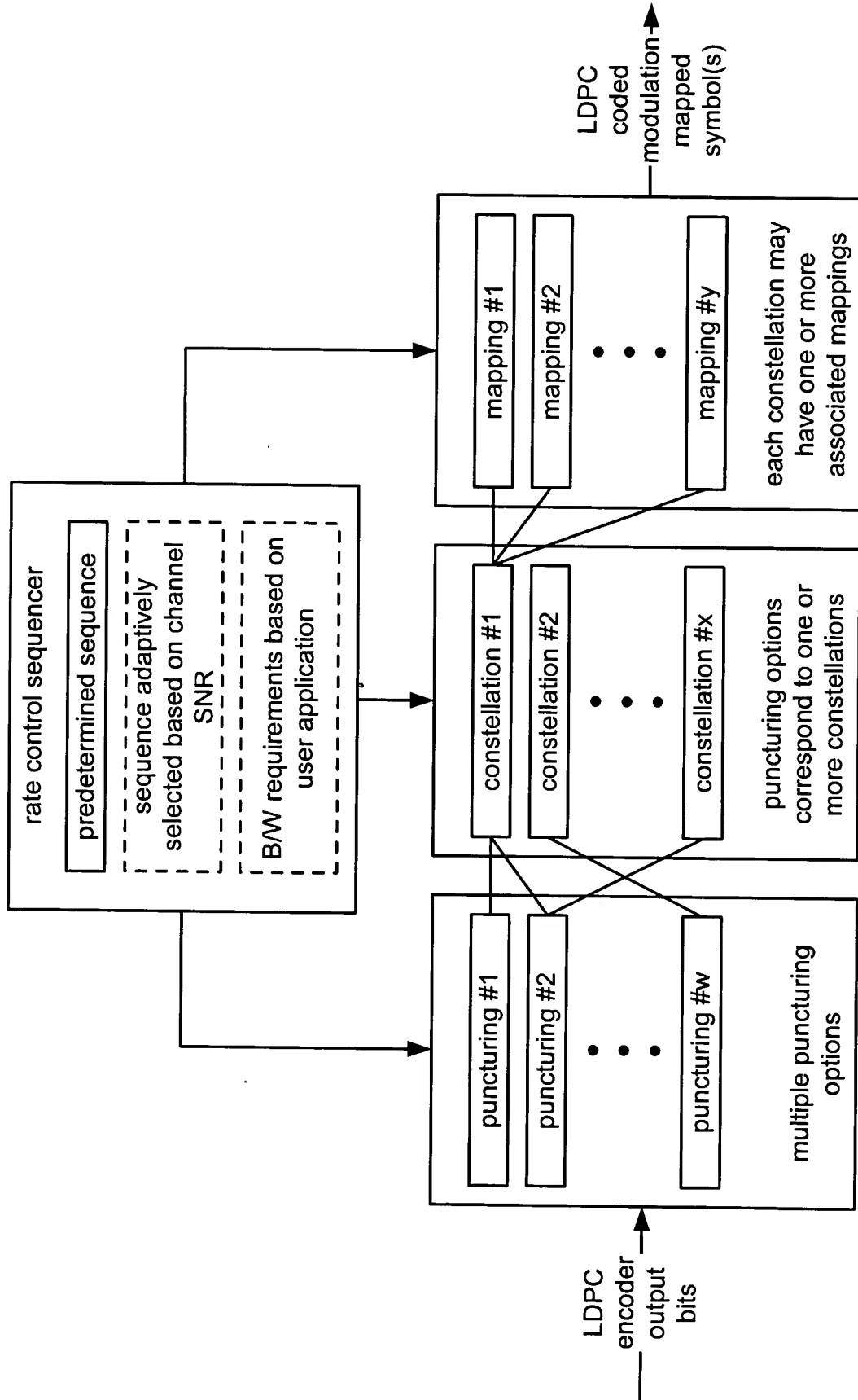
periodic sequencing of LDPC encoder using puncturing and rate control sequencer

Fig. 31



output bits being grouped/re-arranged before being mapped

Fig. 32



generic embodiment of variable puncturing, constellations, and mappings using single LDPC encoder

Fig. 33